

# The Chemical Age

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## Notes and Comments

### Selling Chemical Products

THE importance of chemical research is generally understood by the various branches of the chemical industry, but there are many directions in which the value of market research—and the study of the science of salesmanship—has not yet been realised. With one or two notable exceptions, the chemical producers sell exclusively to other manufacturers, or to package merchants, on a price basis. The products have little or no individuality, and ability on the part of competitors to lower the price results immediately in decreased sales. A main product is never sold until it has acquired individuality in consumer markets, and every effort has been made to maintain that individuality by quality maintenance, trade mark and advertising means. A market promotion organisation should be continuously on the look out for new uses for chemical products and for market opportunities open to products which the manufacturers can possibly develop.

Conditions in no two industries, or in fact, in no two companies, are exactly alike. At the same time, certain broad rules, such as the individuality of a particular product, apply in all cases and under all conditions. The outstanding problem of the chemical manufacturer to-day is to create this individuality, and unless he does so, he can expect nothing but increasingly severe competition as time goes on. The method used depends on the commodity. Where the product is one that retains its original appearance, if not its shape, in subsequent manufacturing operations, and is distinctive enough to be noticed by the consumer, the procedure of indirect consumer advertising is undoubtedly best. This method is expensive, true, but

if the initial work is well done, advertising expenditure can be decreased later, since the users of the product will carry most of the load. Indirect advertising, effective as it is in the case of plastics, falls short of the desired goal when applied to bulk finished products and to process raw materials which lose their identity in process. One, and perhaps the best, remedy in these cases is to extend the manufacturing or marketing procedure until the product sold will have the desired individuality. This may mean selling direct to the consumer, particularly if the product is finished and requires only packaging in small quantities. Other products may be given the desired individuality by setting high quality standards and by taking pains to fit the product to individual industrial markets. In other cases it may be necessary to carry the manufacturing process several steps further along the road to the consumer. In the chain of operation leading to dyed textiles we have the products of coal, of distillate, of intermediates, of dyes, and of dyed fabrics. There is no possibility of imparting individuality to coal, distillate, or to intermediates, but the importance of fast dyes is recognised by the public, and these products can be advertised effectively so that the textile manufacturer will find it profitable to stress the name of the manufacturer or the trade mark in his own advertising. Applying this same reasoning to paints we have a step added to the chain in the form of dry colour, and this too should be capable of exploitation. Chemical manufacturers must popularise their products if they are to avoid cut-throat competition. The life of a patent is short, and competitive laboratories are so prolific that it is never long before other suitable materials reduce competition to a price basis.

### The Evils of High Taxation

SIR FRANK FOX, speaking on behalf of the Friends of Economy at Sittingbourne, made a new and interesting point which we do not remember having noticed before. Sir Frank has brought public expenditure into relation to our working hours, and tells us that for every hour of work we do we have to provide  $7\frac{1}{2}$ d. for the public purse. High rates and taxes were the chief cause of unemployment. The government and municipal expenditure in 1913 amounted to twopence every working hour of the country. In 1930 that figure was  $7\frac{1}{2}$ d. per working hour. From the point of view of the export trade of the country it meant that that  $7\frac{1}{2}$ d., which had to be paid in addition to wages, was as much as was being paid as a wage to the workers in the countries with which we had to compete. It meant that  $7\frac{1}{2}$ d. an hour had to be spent before an article was even manufactured for export, and unless that  $7\frac{1}{2}$ d. was cut down there would be no hope of the country recapturing its old position. Under that staggering burden industry could not afford to employ the labour which it did in the old days.

### The Import Duties Act

PRICES of chemical products have remained remarkably steady since the Import Duties Act came into operation a month ago, and, so far as the chemical industry is concerned the Act is working with comparative smoothness, largely owing to the guidance and assistance which have been given to members by the various trade organisations. We have already published the views of Mr. J. Davidson Pratt, general manager of the Association of British Chemical Manufacturers on the Act, and now we have received from Mr. F. A. W. Paige, secretary of the British Chemical and Dyestuffs Traders' Association, a copy of a letter which that Association has issued to its members this week. It is understood that the Customs administration of the Act will be more or less on the line applied to the Key Industry Duties, and members are requested to notify the Association should any difficulties arise.

For the past three weeks negotiations have taken place with the Customs authorities on the question of Import Duty values. The Association has strongly protested against duty being calculated on any basis other than the customary c.i.f. value, and every effort will be made to maintain this position. The Association is informed by the Customs authorities that foreign currency invoices are converted at the rate of exchange ruling on the date the ships report. The value of special containers, as, for instance, aluminium drums, which form necessary packing for bringing goods into this country and which are normally used for a series of transactions, may be excluded from value for duty of the articles which they contain. (Customs reference, 25273/1932). The Association has had prepared for its members a special declaration as substitute for Customs form C.105.

### Penalising the Inventor

A MUCH needed criticism of the high charges imposed on inventors by the Patent Office was raised by Major Proctor, M.P. for Accrington, when speaking at the annual meeting of the Institute of Patentees, which was held in London on March 23. He was of the opinion that this country should encourage the inventor to a greater degree, which could certainly be

done by an inter-dominion agreement making a patent useful and valid in all parts of the Empire, and also by imposing one inclusive charge such as is operating in America. At present the Patent Office is penalising certain classes of the community who are doing much to increase the prosperity of this country. But the Patent Office is not the only culprit. There are in existence groups of financiers, who have no qualifications for dealing with inventions, but who, nevertheless, have caused an edict to be issued whereby there could be no quotation on the London Stock Exchange of any company formed with the object of developing a meritorious patent until that company had been running for one complete year. This edict, of course, has had the effect of drying up the resources of those people who would find the necessary money for financing genuine inventions.

### Denmark "Buys British"

DENMARK, it is reported, is being swept by a strong sentiment in favour of "buying British." This is an interesting example of the extent to which potential new markets are being opened up to our exporting industries in certain foreign countries by our country's adoption of a tariff policy. The coal trade has already benefited by the decision of the Danish State Railways and other concerns to purchase the whole of their supplies of coal from Britain during this year. Contracts which were lost at the time of the General Strike, and which have since been held by German and Polish exporters, are thus being recovered. Other trades are also beginning to feel the benefit of an increased purchasing demand from Denmark, and there is little doubt that this will be reflected in exports of chemicals, remembering that many of the inquiries received by chemical exhibitors at the recent British Industries Fair came from the countries of Northern Europe, of which Denmark is one. There is every prospect, too, that an impetus will be given to British trade with Denmark by the Anglo-Danish Exhibition which is to be held in Copenhagen from September 24 to October 9. In Denmark the arrangements for the exhibition are in the hands of the British Import Union. This exhibition will be devoted entirely to the display of British products, and it is hoped that its influence will extend to other Scandinavian countries.

### Books Received

- A TEXT-BOOK OF ORGANIC CHEMISTRY. By Dr. Julius Schmidt. English Edition by H. Gordon Rule. London: Gurney & Jackson. Pp. 843. 25s.  
FUEL TESTING: LABORATORY METHODS IN FUEL TECHNOLOGY. By Godfrey W. Himus. London: Leonard Hill, Ltd. Pp. 257. 15s.

### The Calendar

- April 4.—Society of Chemical Industry (London Section). "The Application of X-rays to Chemical Industry." Sir William Bragg. 8 p.m. Burlington House, London.  
April 6.—Society of Public Analysts. 8 p.m. Burlington House, London.  
April 6.—Society of Glass Technology (London Section). "Statistical Methods of Handling Test Results, with Special Reference to the Testing of Glassware." Bernard P. Dudding. 7.30 p.m. Science Museum, South Kensington.  
April 8.—Chemical Engineering Group. "Special Alloy Steels as Applied to Chemical Engineering." T. G. Elliot, R. J. Sarjant, and Wm. Cullen. Sheffield.  
April 8.—Oil and Colour Chemists' Association (Manchester Section). Annual meeting and smoker. College of Technology, Manchester.  
April 8.—Institute of Fuel (East Midlands Section). Annual general meeting of the Section. "The Conditioning of Boiler Feed Water." V. B. Harley-Mason. 7 p.m. University College, Nottingham.

## The Society of Dyers and Colourists

### Annual Meeting and Dinner

THE annual meeting and dinner of the Society of Dyers and Colourists was held at the Midland Hotel, Manchester, on Wednesday evening, March 23, when Mr. Lennox B. Lee, President of the Society, and chairman of the Calico Printers' Association, presided.

In the annual report of the Society it was stated that there had been a loss of revenue on the year due entirely to the decrease in the number of members and subscribers. It was gratifying, however, to record that the expenditure of the Society had decreased in every way, and a large portion of the deficiency was due to the removal of the general offices. It was hoped that this removal would, later, not only facilitate the work of the Society, but would further reduce the cost of administration. Apart from the financial loss, the Society had experienced a most satisfactory year, and the various sections had had good attendances at a full programme of meetings.

#### The Fastness Tests Committee

The work of the Fastness Tests Committee with the objects of standardising the methods of testing the fastness of dyed and coloured materials had not yet been completed. It was hoped, however, that the work would be brought to a successful conclusion during the year 1932, but in order to arrive at such a conclusion further funds were necessary. Associations, companies, and private firms had already contributed a sum of over £4,300 and the appeal was now made to smaller firms in the industries who would derive equal benefit from the completion of the work.

The Gold Medal of the Worshipful Company of Dyers for the year 1930-31 had not yet been awarded.

Upon the motion of Mr. Thorpe Whitaker, seconded by Mr. J. Denton, Mr. Lennox B. Lee was re-elected president of the Society for the ensuing year. Messrs. James Crawford, Ernest T. Holdsworth, and F. J. Farrell were re-elected vice-presidents of the Society, and Messrs. W. P. Dreaper, J. Mackie, and W. P. Walker were re-elected as members of the Council. Other officers for the ensuing year include Mr. John Denton (hon. treasurer), Mr. H. Jennison (hon. secretary), and Mr. H. E. Potts (hon. patent agent).

#### The Annual Dinner

Among the guests attending the annual dinner were:—The Lord Mayor of Manchester, the Rt. Hon. D. H. Hacking, the Prime Warden of the Worshipful Company of Dyers (Lt.-Col. W. H. Hatchard Smith), Sir Christopher T. Needham, Sir Arthur A. Howarth (chairman, Manchester Royal Exchange), Sir Gerald Hurst, the Vice Chancellor of the Manchester University (Dr. W. H. Moberly), Sir Thomas Robinson (chairman of directors, Bradford Dyers' Association), Dr. Herbert Levenstein, W. H. Barritt (chairman, Allied Association of Bleachers, Dyers, Printers and Finishers), Dr. S. G. Barker (Director of Research, Wool Industries Research Association), R. D. Chorley, A. Frobisher (Wool Industries Research Association), R. S. Horsfall (British Dyestuffs Corporation), C. C. Railton, J. Hamer, F. W. Hewitt and N. G. McCulloch (Calico Printers' Association).

Officials of the Society who attended included Ernest T. Holdsworth, Professor F. M. Rowe, and Thorp Whitaker (vice-presidents), H. H. Bowen (chairman, Publication Committee), F. Scholefield (chairman, Manchester Section), N. Chappell (hon. secretary, Manchester Section), W. P. Walker (chairman, West Riding Section), R. B. Brown (chairman, London Section), James Bruce (chairman, Scottish Section), John Denton (hon. treasurer), H. Jennison (hon. secretary), H. E. Potts (hon. patent agent), and J. B. Atkinson (secretary).

#### The Objects of the Society

The Rt. Hon. DOUGLAS H. HACKING, who was the guest of the evening, proposed the toast of "The Society of Dyers and Colourists." He said that industrialists in this country had too long ignored the advantages to be derived from having trained chemists to assist them in their several trades. Students of industrial development throughout the world had expressed the opinion that there was very little doubt that

the reason the German industry was so much ahead of our own in pre-war days was on account of the fact that chemists were a recognised part of every factory in Germany, whereas we, for our part, were inclined to believe that practical knowledge was all that was required in order to achieve success. To a very large extent indeed, we had ignored the theoretical and the experimental side of industry, but that state of things, thank goodness, was now no longer the case. He was very pleased to learn that the Society received much encouragement from the textile trades of Lancashire and the West Riding of Yorkshire, and that encouragement could not be more clearly exemplified than by the presence in the chair of a gentleman who represented one of the most important industrial concerns in the country and who was also the president of the Society.

Mr. LENNOX B. LEE (President of the Society) in responding to the toast, said that the Society had that day held its 48th annual meeting and was therefore rapidly approaching its jubilee. Since its inception it had kept steadily to the forefront its principal object, namely, "the promotion of scientific and technical knowledge among textile colourists and the general advancement of the interests of the tinctorial and allied industries." Its literature and lectures afforded every facility for keeping pace with new ideas and methods of scientific development, while its journal, which was to be found in all parts of the world, was recognised as the premier book of reference in regard to dyeing and kindred industries.

Sir GERALD HURST proposed the toast of "The Allied Societies," which was responded to by the Prime Warden of the Worshipful Company of Dyers (Lt.-Col. W. H. Hatchard Smith); Sir Arthur Haworth, chairman of the Manchester Royal Exchange, Ltd., proposed the toast of "The City of Manchester," which was responded to by the Rt. Hon. the Lord Mayor of Manchester (Councillor Ellis Green), and Dr. Herbert Levenstein proposed the toast of "Our Guests," which was responded to by the Vice-Chancellor of the Manchester University (Dr. W. H. Moberly).

## A New Type of Explosion Hazard

### Mercury in Contact with Liquid Ammonia

DANGERS attending the contact of mercury with liquid ammonia are reported in the current News Edition of *Industrial and Engineering Chemistry*.

In the course of certain engineering investigations of an ammonia refrigerating system several mercury manometers were attached directly to the liquid ammonia lines. Two of the manometers were installed during the summer of 1928 and the remaining five attached about six months later. All were in use for a period of one to two years immediately after installation, but during subsequent years they were not in active service. At one time or another the mercury and ammonia were withdrawn from five of the manometers, but in two of the instruments these liquids remained until October 26, 1931, when all were removed for cleaning. On the following day the glass tubing was removed from each of the manometers and the iron piping and fittings of four were freed of loose dirt and iron rust, by means of an air blast, without mishap. However, the instant the air was directed into the fifth manometer, it exploded violently, shattering a  $\frac{1}{4}$  in. cast-iron elbow and sending several pieces of metal through windows making comparatively clean-cut holes, indicating that the fragments were travelling with high velocities.

The exact cause of the explosion is not known. It is practically certain, however, that it was not due to combustible gases, for the passageways through the relatively short lengths of metal tubing of the manometers had been open to the air for several hours, permitting the diffusion and escape of ammonia and any other vapours present. Furthermore, the explosion was far too violent to be attributed to the ignition of gases. It would therefore appear that the explosion was caused by some compound formed by the interaction of mercury and ammonia. In consequence, contacting of mercury with ammonia for appreciable periods of time, even at relatively low temperatures, should be avoided.



## Selenium in Rubber Compounding

By T. L. Garner

ALTHOUGH it had been known for some years that vulcanisation could be effected by means of the other members of the sulphur family, particularly by selenium, it was not until recent years that the latter achieved any importance in the rubber industry as a compounding ingredient.

When used without the presence of sulphur, rubber compounds containing selenium vulcanise in a similar manner to sulphur containing rubber mixings in the presence of suitable organic accelerators, and it has been claimed that compounds vulcanised with selenium generally give better ageing properties than those cured by sulphur. In 1923 Williams (*J. Ind. Eng. Chem.*, 1923, 15, 1019) claimed that the use of selenium in rubber compounds prevents the formation of metastable solutions of sulphur in rubber, thus preventing the initial rapid bloom of uncured stocks, but so far as the writer has been able to determine these claims do not appear to be generally substantiated, and selenium will under unfavourable conditions give rise to a very objectionable greenish-yellow bloom.

By far the most startling claims made in connection with the use of selenium in rubber, however, were initiated by Bierer and Davis (*J. Ind. Eng. Chem.*, 1926, 18, 348) in a report on a tread rubber, containing a proportion of reclaimed rubber, where they found that the addition of only 0.5 per cent. of selenium increased the relative abrasion resistance by about 50 per cent.; an increased addition to 1.25 per cent. did not give a further improvement in abrasion resistance. This was more fully described in a publication by Boggs and Follansbee, (*India Rubber Indust. Trans.*, 1926, 2, 290) who stated that when selenium and sulphur are used together to produce soft vulcanised rubber, the selenium acts as an efficient accelerator as well as a vulcanising agent, and it is suggested that the accelerating action produced by the selenium is due to selenium sulphide and that abnormal physical results are due to the selenium and sulphur together adding to the rubber molecule. Many chemists in the rubber industry, who had prior to the above publication experimented with selenium in rubber with but indifferent results, were therefore inspired to further efforts and there can be no doubt that after 1926 many laboratories belonging to rubber factories were endeavouring to repeat and confirm the experiments described by Boggs and Follansbee.

### Improvement of Abrasion Resistance

The improvement of abrasive resistance of rubber compounds is a matter of such great importance that no factory of standing can afford to neglect any opportunity of using any new method to this end. It was fairly soon apparent, however, that in European countries the desired confirmations were not being obtained and doubts were thrown on the accuracy of the previous work in various quarters before the first publication by Twiss (*India Rubber Inst. Trans.*, 1928, 3, 298) in this connection definitely stated that, although he had completely reproduced the experiments of Bierer and Davis so far as possible, he found only small and irregular variations in abrasion resistance all within the limits of experimental accuracy; in this communication Twiss refers to other anonymous experimenters who had obtained similar results. Soon after this Rimpel (*Le Caout.*, 1928, 25, 13850) in a discussion at a meeting of the Kautschuk Gesellschaft at Ham-bourg stated that his experiments to obtain improved wear in a rubber heel by the incorporation of selenium had proved abortive; on the other hand, it is only fair to add that during the same discussion Kirchoff stated that he had been able to obtain threefold improvement in abrasion resistance of a tyre tread by its use.

More recently Rimpel (*Kautschuk*, 1931, 7, 94) has conducted an exhaustive research into the problem of selenium and abrasive resistance, carrying his experiments through to practical road tests on tyre treads containing selenium. His experiments show that while inaccurate results might be obtained from laboratory abrasion tests, road tests proved that greater resistance to abrasion could not be obtained by the incorporation of selenium, provided correctly vulcanised rubber was used in making the comparison. He found that

selenium was an active accelerator in the presence of sulphur, giving an improvement in abrasion in non-accelerated stocks (as would any other accelerator), of organic accelerators. The same author is now investigating the claims for improved flexing resistance claimed for rubber compounds containing selenium.

### Active and Inactive Selenium

There is, therefore, ample evidence that so far as the majority of chemists investigating this problem in Europe is concerned the claims made by the American investigators cannot be sustained and the matter is extremely unsatisfactory. All the experimenters whose names have been mentioned in this short review are well-known scientists and one must inevitably conclude that in some way the American investigation was carried out under different conditions to that obtained in those made in Europe, some factor at present not clearly defined, accounting for the increase in abrasion resistance. Boggs stated in the discussion on his paper that he had used the natural grey monoclinic selenium ground to 200 mesh and obtainable readily in commerce, but Esch, in the discussion in which Rimpel took part, mentioned above, suggested that the differences in results might lie in the form of the selenium used for the experiments. He suggested that there might be active and inactive selenium, in relation to vulcanisation, or that some insignificant impurity in some of the mixings might poison the selenium, but if the latter is the case one would hardly have expected the results obtained by Twiss to have completely repudiated the results of Boggs and Follansbee.

## Phthalic Anhydride in U.S. Patent Litigation

### Validity of Basic Government Patents

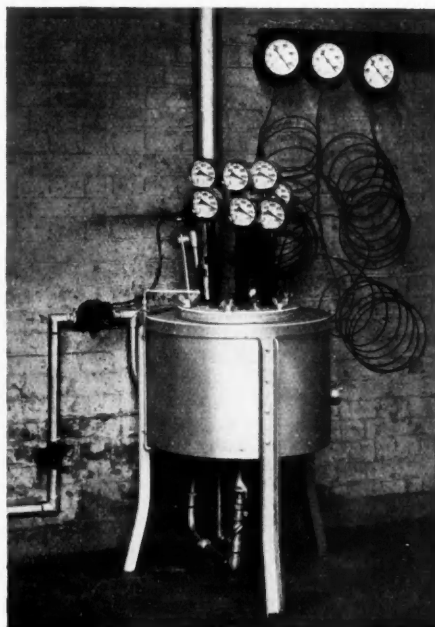
THE United States Department of Agriculture has filed with the United States Court of Customs and Patents Appeals a suit to determine the validity of basic government patents under which phthalic anhydride has been manufactured in the United States in large quantities since the world war. This is the first time in history that the Government has appealed a decision of the Patent Office, and a special order amending the rules of the court had to be made to cover such cases.

The patent involves the high-temperature vapour-phase catalytic process of manufacturing phthalic anhydride, phthalic acid, benzoic acid, and naphthaquinones by mixing naphthalene gas with air or oxygen and catalysing with vanadium pentoxide at temperatures between 350° and 550° C. The process was apparently worked out simultaneously in 1916 by Alfred Wohl, a German chemist, and H. D. Gibbs and Courtney Conover, of the United States Department of Agriculture. A United States patent was issued to Gibbs and Conover, November 19, 1918, which they dedicated to the use of the Government or American citizens without payment of royalties. In 1924, Wohl filed application for an American patent, which was granted October 6, 1931, after much litigation, and the Gibbs-Conover patent was cancelled. The controversy hinges on the dates on which the inventors actually made successful tests of their theories. Gibbs and Conover conducted experiments in the last week in August, 1916, but there is no proof to show that the experiments were completed successfully prior to September 7. Wohl filed application for a German patent June 28, 1916, but specifying a lower range of temperatures and describing the product as pure naphthaquinone. September 4, 1916, he filed an amendment, calling for temperatures within the range of the Gibbs-Conover process, and this amendment was accepted by the German Patent Office September 9. The United States Patent Office first ruled that September 9 should be taken as the date when Wohl first reduced his invention to practice, but its final decision was that Wohl's invention dates from September 4, giving him priority over Gibbs and Conover. The Patent Office also held that the description of the products obtained is immaterial, as the patent is for a process, not a product.

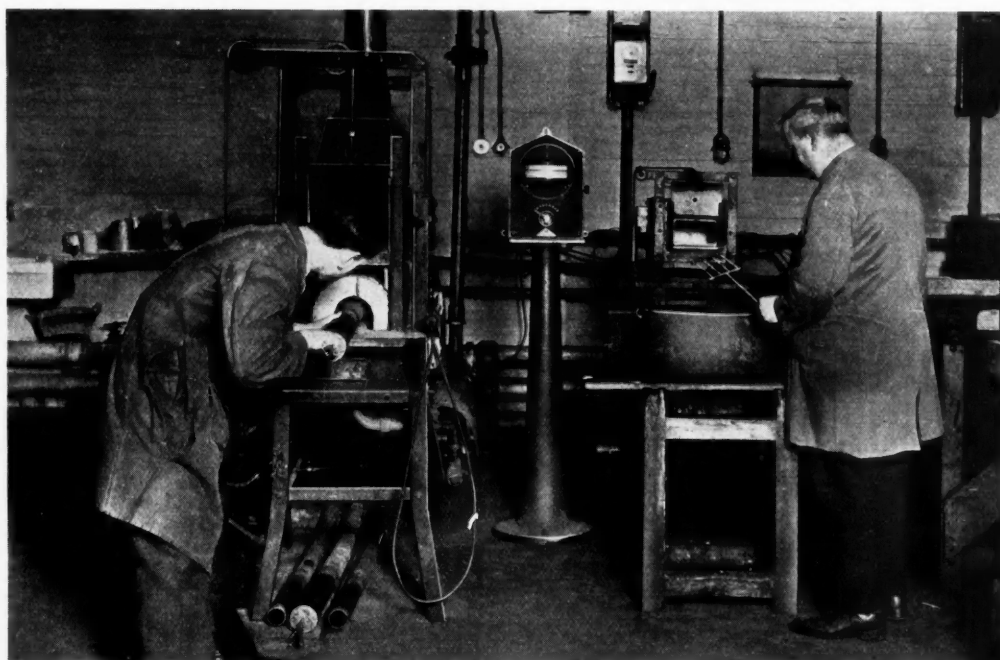




THE BORE OF THE CAPILLARY TUBE IS SAND-BLASTED AND THEN SUBJECTED TO VIBRATION TO LOOSEN THE SAND PARTICLES.



THE HIGH RANGE TYPE AGEING BATH WHICH IS EMPLOYED IS CAPABLE OF MAINTAINING A TEMPERATURE OF 1,200° F.



THE HARDENING, TEMPERING AND ANNEALING OF THE BOURDON TUBE IS CARRIED OUT UNDER VACUUM.

### Stages in the Manufacture of "Mercury-in-Steel" Thermometers

*In the Negretti and Zambra Mercury-in-Steel Thermometer, which is now widely used on chemical plant because of its robust nature, the mercury is forced from the bulb by way of a length of capillary tubing (0.007 in. bore) to actuate a Bourdon tube which, in turn, moves a pointer over the dial of the instrument. In view of the accuracy which is demanded, the manufacture of this type of instrument must be carried out with great attention to minute details.*

## Use of Creosote as a Wood Preservative

### Examples at Edinburgh Building Exhibition

*The British Wood Preserving Association's film illustrating the preservative effect of the application of creosote to timber was shown by Mr. H. Dobinson, general manager of the National Creosote Committee and chairman of the Film Committee of the British Wood Preserving Association at the recent Building Exhibition at Edinburgh. As already reported in THE CHEMICAL AGE, steps are being taken to improve the film, and it is hoped to exhibit it throughout Great Britain. At this exhibition, Mr. James Walker, of James Walker and Co., Ltd., Restalrig Saw Mills and Creosoting Works, Leith, read a paper on "Preservation of Wood," from which the following extracts are taken.*

RAILWAY sleepers, telegraph poles and farmers' stobs are outstanding examples where timber protection is most needed, and can be given. Creosote oil brushed on is of little value as it will not penetrate much beyond the outside of the plank. Users are often deceived by wood which is blackened by a wash of this antiseptic, believing it to be impregnated. The immersion process is much more thorough. It consists of a large tank full of the desired liquid into which the wood is placed and weighted down. In course of time the creosote oil penetrates the wood sufficiently, but a long time, say anything up to a month, is required. Plant for this method is often owned by small estate proprietors who can then make use of the wood from their forests, even what is otherwise valueless. Boiling is a speeding up of this idea by means of a furnace under the tank. Heat makes the oil thin and so capable of quicker penetration. There is a danger of making it too hot and so destroying the fibre of the wood. The accepted method for those who require to preserve large quantities of wood quickly is the pressure plant, which is by far the most thorough method.

#### Preliminary Treatment

With creosoted timber, or timber treated under pressure by any process, all cross-cutting and manufacturing should be done to the wood before treatment, because it is easier handled, but particularly because, if treated first, the outer skin of the wood has to be cut into, and damp or insect enemies may then get in through weakened defences. For example, a gate has to be made of treated wood. Let it be planed, mortised, tenoned, bored for bolts, etc., and if its dimensions be within the limits of the creosoting cylinder, let it be fully assembled. It makes a pleasanter job for the joiner. Besides, the permeation of the wood is more thorough, as the preserving agent is pressed through the bolt holes and tenons to the very heart of the wood. It is a mistake to think that treated wood shows black right to the heart. The sapwood should be well coloured, but with good close-grained timber there is not much evidence to the eye in the heartwood, except at the ends.

An objection to creosote in wood is that it has an odour which some people dislike. Another point brought against it is its inflammability. There is a wrong impression here, however, as experience shows it is more difficult to ignite than untreated wood. A discussion among American railway engineers on this subject brought out that, where telegraph poles were placed in swamps, in a dry spell the grasses dried up and were often ignited by spontaneous combustion. If these poles were untreated, they often caught fire and were burnt down. When they were creosoted, they did not even catch fire. In America many railway trestle bridges are built of creosoted wood. This shows little fear of fire, in view of the sparks from the funnels of locomotives. Most of the alternatives to creosote are soluble salts. Soluble salts, however, are in a short period washed out of the wood if exposed to the weather, and their effect lost. They do not become permanently deposited in the cells of the wood as creosote oil does, but some of them can be painted over, which helps to retain them.

#### Uses for Preserved Wood

Paving blocks, palings, wood for terracing sports grounds, borders of bowling greens and garden paths, wooden bridges and piers, byres, stables and their windows, barges and snow cradles should be treated with creosote. Wallplates and sleeper joists of houses should be so treated, in order to prevent the causes of rot from coming up from the ground. The extra cost of creosoting under pressure in the case of such bungalows as those shown at the Edinburgh exhibition would not exceed £3 per house. My firm creosotes all its lorry wheels. For a year they are used bare of colour, but

after that period they can be painted. My greenhouse is laid on a creosoted wallplate, the posts for a swing are creosoted. The sashes of a coldframe are similarly treated, as is the garden barrow. Feeding troughs are the better of being preserved, and even pegs for a tent. The purposes to which treated wood can be put with advantage are innumerable and will suggest themselves to users. The cost is recovered in a few years. Cheap wood such as Scots fir, even immature wood, can be made to last as long as teak, greenheart or oak, and there the saving is at once apparent. To get the results indicated here the treatment must be "under pressure."

The Government experimental station at Princes Risborough is a live department. At the Highland Agricultural Society's Show lately held in Edinburgh, a stand was taken by the Forest Products Research Laboratory, and samples of wood attacked by the various pests were on view, also segments of creosoted wood cut so that the permeation by the preservative in different kinds of trees might be compared. The Department also showed samples of a plank of wood sawn in two, the cut being made so that the halves should be as equal in resistance to decay as it was possible to get them. One piece was impregnated with preservative; the other left as it came from the saw. Both parts had been placed together where likely to be attacked by fungus or other destructive agency. At the end of the period the two pieces were shown side by side. It was illuminating to see one with its fibre eaten into, sometimes quite crumbly with decay, while its fellow—part of itself—was sharp edged, firm and unaffected. At the same show the British Wood Preserving Association had a somewhat similar exhibition where the pointed ends of farmers' stobs appeared, some untreated, and those all decayed more or less, the average life being only about six and a half years in the ground, kinds were, after a period of 20 to 47 years, quite fresh.

#### Some Striking Exhibits

At the Building Exhibition James Walker and Co., Ltd., showed one stob of creosoted Scots fir which, after being 25 years in the ground, left one guessing which end was buried; a segment of a telegraph pole 46 years in use; a piece from a pile 50 years in use; a section of a telegraph pole—one of the main telegraph line from London to Ireland—57 years in the ground, taken down only because higher and larger poles were needed; and 3 ft. of a wooden trestle of the original Highland Railway Bridge over the Beaully River. After 50 years in use, this bridge was replaced by a steel one, and this timber was put into another railway bridge over the Attadale River. This section of wood had been over 70 years creosoted. All these exhibits were sound and in good condition, and were shown by courtesy of the General Post Office, the Forest Products Research Laboratory and the British Wood Preserving Association. It is only about 94 years since Bethell patented his creosoting process, so that the question of how long time must elapse before decay sets in must be left to future generations to discover.

#### Ammonium Sulphate in the United States

AMMONIUM sulphate imports into the United States reached a peak in 1931. The total of 114,776 long tons represents a phenomenal increase over the 1930 receipts of 34,964 tons. Prior to the World War, the United States imported large quantities of sulphate, early records indicating entries of over 92,000 tons in 1911 of which Scotland supplied 53,000 tons, England 33,000 tons and Australia 2,000 tons. Installation of by-product recovery ovens at domestic coal distillation plants sharply reduced ammonium sulphate imports and made an important surplus of this fertiliser material available for export. The upward trend in imports in 1924 when European producers of synthetic sulphate commenced large scale exporting of their material.

## Chemical Industry Lawn Tennis Tournament

### Closing Date for Entries

FULL particulars were given in THE CHEMICAL AGE last week of the second annual Chemical Industry Lawn Tennis Tournament. Pressure of space prevents extended reference to the tournament in this issue, but we would remind readers that

May 2 is the latest date for entries. The tournament is limited to men's doubles and is open to all engaged in any capacity in the chemical industry throughout the country. The rules and entry form are reprinted below.

### Rules

1. Every competitor must be a member of the chemical industry, either as a principal or a member of a staff. There is no entrance fee of any kind.
2. Each pair must be members of the same, or an associated, firm.
3. The Challenge Cup shall be competed for annually on courts of any surface in accordance with the Rules of Lawn Tennis and the Regulations of the Lawn Tennis Association. The winners of the Cup shall make arrangements for its safe custody and insurance.
4. The competition shall be conducted on the knock-out principle, and the best of three advantage sets shall be played in all matches.
5. Entries shall be made not later than May 2, 1932, and addressed:

"Lawn Tennis Tournament,"  
"The Chemical Age,"  
Bouverie House,  
Fleet Street, London, E.C.4.

6. The draw shall be made on the first convenient day following the close of entries. The dates on or within which the several rounds must be played will be published in THE CHEMICAL AGE.
7. The Editor of THE CHEMICAL AGE shall have the right to scratch any players who fail to play off their matches by the stipulated dates, or who otherwise fail to conform with the rules and regulations governing this competition.
8. Except in the case of the special period set apart for the final

stages of the competition, players drawn against each other must make their own arrangements for playing off their match on a court mutually agreed upon. In the event of disagreement, the first name drawn shall have the right to choose the ground.

9. In the general interests of competitors throughout the country it has been decided to divide into areas as far as possible all matches up to, and including, the Semi-Finals, the rule as stated under Clause 8, however, still standing.

10. The result of each match must be sent by the winners to the Editor of THE CHEMICAL AGE, signed by all four players (winners and losers) immediately after the match, and must reach the office of THE CHEMICAL AGE not later than by the first post on the day following the final day for playing off the round.

11. If any player be not present at the agreed place or time of the match, opponents shall be entitled to a walk-over, after having allowed reasonable time (say, a maximum of one hour) for the others' appearance. If the players find it impossible to play off their match on the day originally chosen, they must play it on any other day, to which both sides agree, within the stipulated period.

12. Any dispute arising between players, or otherwise, shall be referred to the arbitration of the Editor of THE CHEMICAL AGE, whose decision shall be final.

13. While competitors will make their own arrangements as to hard or grass courts for the preliminary rounds, it must be understood that the Finals will be played on hard courts.

[The Latest Date for Receiving Entries is May 2, 1932].

*Cut along this line and post as directed.*

### Entry Form

We have read the Rules of THE CHEMICAL AGE Lawn Tennis Tournament, and agree to abide by them.

Name of Competitor .....	Name of Competitor .....
Name of Firm .....	Name of Firm .....
Firm's Address .....	Firm's Address .....
.....	.....
Telephone No. ....	Telephone No. ....

## Imperial Chemical Industries, Ltd.

### Directors Report "Encouraging Signs of Revival" in Home Demands

THE annual report and accounts of Imperial Chemical Industries, Ltd., for the year ended December 31, 1931, were issued yesterday (Friday). The directors state that the world depression, including the downward movement of the general price level which first affected the chemical industry in the second quarter of 1930, continued to restrict business throughout the year. Since the abandonment of the gold standard in September last, there have been encouraging signs of a revival in home demand. In foreign markets, the lowered value of the pound has increased competitive power, though the period of effectiveness in 1931 was too short to show any appreciable increase on the total volume of trade.

Compared with 1930, the volume of home trade in alkali products showed only a trifling fall. Chlorine products were sold in larger volume, but the sales of the chief acids continued the decline of 1930. The main export trade in the alkali and general chemical groups concerns alkali products. In 1929 and 1930 sales showed hardly any variation. In 1931, however, the volume of export business in these products showed a sharp decline, which was unevenly distributed over the principal markets. In China, the catastrophic floods of 1931 caused a much greater fall than the average, but in India, despite unsettled conditions, the trade volume showed only a small decrease.

The total tonnage of saleable coal raised in 1931 was approximately 9½ per cent. less than in the previous year. This condition was reflected in the sales of explosives in the home market. Similar conditions obtained abroad through a general diminution in mining activity, but relative to the available trade the position was more than maintained.

The aggregate sales of fertilisers in 1931 showed a fall of 19 per cent. The excess of world producing capacity over effective demand in the fertiliser industry continued to dominate the price level in 1931. Products other than fertilisers continue to increase both in volume and number, and satisfactory progress has been made during the year.

The volume of all sales of dyestuffs increased during the year by 9 per cent., of which the larger part was attributable to export markets. In the last quarter of the year the home market also showed an increased demand. The consolidation of the dyestuffs industry in this country was carried a step further by the acquisition by I.C.I. of the shares of the British Alizarine Co., Ltd.

Sales of artificial leather during 1931 fell about 6 per cent. below those of 1930. The decline was mainly due to smaller deliveries to the motor trade. The general trade of the lime group was still affected by the depression in the building trade and other industries.



In the metal group the products comprise non-ferrous metal in all its forms, sporting and small arms ammunition, lighting fasteners, motor cycles and radiators. With the exception of lightning fasteners, the demand for which continued to expand, sales again moved downwards. The fall was due to a further contraction of demand, notably in the motor industry.

Sales of miscellaneous products, such as cellulose paints and varnishes, gas mantles and electric insulators, continued to be affected by the depression, though not more than in 1930.

Expenditure on new construction during the year has been mainly confined to the normal development and exploitation of existing manufacture. Buildings and plant have been maintained in a high state of efficiency, and approximately £1,750,000 has been expended during the year towards this object and charged wholly against profits.

The gross income for the year 1931 amounts to £4,668,685,

as compared with £5,129,757 for 1930. Bearing in mind the general contraction of world trade in 1931, the directors consider that the Company has done well to avoid any greater falls in the volume of its trade than those indicated, and to be able to present this satisfactory profit. A steady and successful pursuit throughout the whole organisation of a vigorous policy of efficiency and economy has contributed to this result. Out of the gross profit of £4,668,685 the directors have appropriated £1,000,000 to the central obsolescence and depreciation fund and £260,395 for income tax. With the balance brought forward from 1930 of £653,483, the balance available is £4,061,773.

The preference dividends for the year were paid on the due dates. An interim ordinary dividend of 1½ per cent., actual, was paid on December 1, 1931. The directors recommend a final ordinary dividend of 3 per cent., making 4½ per cent. for the year.

## A New Manufacturing Process for Bleaching Powder

### An Italian Development

A NEW method for the production of bleaching powder has been developed and put into commercial operation at the works of the Società Elettrica ed Elettrochimica del Caffaro, Brescia, Italy. In the hydrated form the product contains 38-39 per cent. of available chlorine and has a water content of about 6 per cent.

According to an account given by A. Carughi and C. Paoloni, in the current issue of *Chemical and Metallurgical Engineering*, the process employed represents a distinct departure from methods previously in use. The reaction between hydrated lime and chlorine takes place through the medium of an organic liquid such as carbon tetrachloride, which is capable of dissolving chlorine, but is inert toward lime and chloride of lime. Thus the finely divided lime particles have their entire surfaces exposed to the action of chlorine, which rapidly acts upon them. As the inert liquid readily absorbs the heat of reaction, it uniformly distributes this heat over the lime particles or over the bleaching powder particles in progress of building; therefore, during the reaction they are constantly kept at the same temperature as the liquid. The carbon tetrachloride accordingly acts as a temperature regulator, and also serves as a means of crystallisation of the bleaching powder—at the end of the reaction when the temperature of the mass is dropped below 20° C.

#### Dehydration without loss of Chlorine

The tetrachloride is separated from the bleaching powder by distillation in vacuum at a low temperature. During the distillation, the latter is partially dehydrated and thus made more stable. The anhydrous form is obtained by either of two methods. One consists in complete dehydration under high vacuum at the end of the vacuum distillation of the tetrachloride. This dehydration of the material is accomplished without loss of chlorine and without decomposition. The other method of drying takes the form of dehydration in the same carbon tetrachloride in which the hydrated product has been produced. If at the end of the reaction the carbon tetrachloride is boiled, it carries off part of the water from the product. The quantity thus removed is dependent upon the duration of the distillation. If the tetrachloride vapours are condensed and the condensate, after being freed from water, is continuously returned to the boiling mixture, the product can be entirely freed of water of crystallisation.

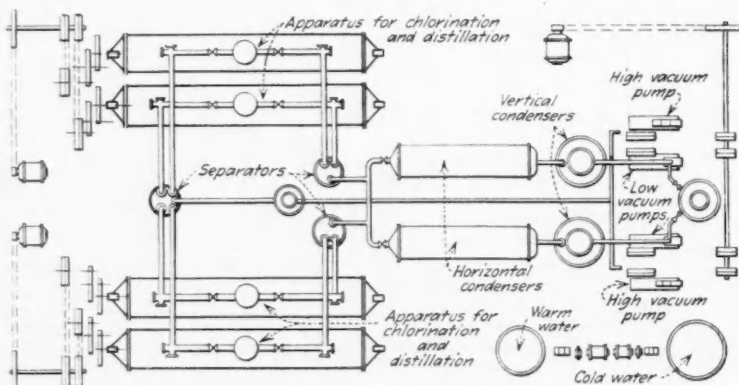
Though this process seemed to be simple, before it could be put into operation the fundamental problems had to be

solved. Almost all of the carbon tetrachloride used in the cycle had to be recovered by an economical method; and the process had to be made commercial by using equipment complying with all the requirements of practicability, strength, and tightness. The problem of recovering the tetrachloride was solved by means of distillation under a vacuum at low temperature and condensation of the vapours at low temperature, when the recovery effected is about 99.5 per cent. The second problem was solved by the use of cylindrical equipment fitted with a stirring device and jacket.

The plant includes four cylindrical containers provided with stirring devices and jackets for hot and cold water circulation; two horizontal and two vertical condensers capable of condensing quickly and completely the whole of the distilled tetrachloride; a small refrigerating plant for cooling by means of brine; and two vacuum pumps for distillation of the tetrachloride and dehydration under high vacuum. The individual equipment works intermittently, but continuity of working of the aggregate is secured by the four which operate with a suitable time lag with respect to one another.

After the lime is loaded into the reaction chamber, the carbon tetrachloride is introduced; and while the stirring device is revolving, the chlorine gas is introduced. The temperature is adjusted from the outside by circulating cold water through the jacket so as to maintain the internal temperature at 35-40° C. The heat exchange between the inside and outside of the apparatus is satisfactory, owing to the presence of the tetrachloride, which acts as an intermediary. On completion of the chlorination, the temperature is lowered to about 20° C. in order to crystallise the product. After this, the tetrachloride is distilled under vacuum at about 25-30° C. by circulating hot water through the jacket of the equipment and brine through the condensers. Owing to the large evaporation surface represented by the bleaching powder particles the carbon tetrachloride evaporates rapidly and is recovered in its entirety in the condensers, after which it is ready to be returned to the manufacturing cycle.

The product thus dried, known as "Siclor," is conveyed by means of screw conveyors into a bin or directly into casks. The loss of tetrachloride is about 2.5 kg. for each 100 kg. of the product. The consumption of electrical energy for driving power and cooling purposes is 20-20 kW per 100 kg. of product; the consumption for heating purposes is about 10 kg. of coal per 100 kg. of product.



GENERAL LAY-OUT OF THE PLANT AT BRESCIA.

## International Society of Leather Trades Chemists

### Meeting of the British Section

THE March meeting of the British Section of the I.S.L.T.C. was held at Leeds University on March 19, when Mr. F. C. Thompson was in the chair. Reporting on the work of the British Section Tannin Analysis Committee, Professor McCandlish stated that the work was now being continued on the determination of insolubles, particularly by the Riess method, and that promising preliminary results had been obtained. Professor McCandlish also proposed "That the British Section of the I.S.L.T.C. shall adopt the Candle method of filtration as the only permissible method for members of the Section." This represented the considered opinion of the Tannin Analysis Committee.

Professor McCandlish and Mr. Thompson, among others, emphasised that the resolution was not to be regarded as in opposition to the decisions at Basle, by which two alternatives were allowed. Adoption of the resolution was simply making a definite choice of one of the allowed alternatives.

The resolution was unanimously adopted.

Professor McCandlish stated that the Tannin Analysis Committee wished to withdraw the resolution on the agenda reading "That the British Section recommend to the Executive Committee of the Society that the candle method of filtration be the only one permissible in the I.S.L.T.C."

Mr. A. B. CRAVEN proposed the acceptance of an invitation to join the British Standards Institution, and pointed out that membership would enormously enhance the standing of the Society's official methods and could not fail to be of great benefit in many directions. The meeting agreed to Mr. Craven's proposal and he was thanked for the considerable work he had done in this matter on behalf of the Section.

#### Points from Papers

A number of interesting papers were then presented. In that on "Water Penetration Test of Sole Leather," by Dr. D. Burton, the effect of humidity of the atmosphere on the results given by the water column test was shown by taking adjacent samples of leather and noting the times required for the water to penetrate when the apparatus stood over (a) water and (b) sulphuric acid. In every case less time was required over water. Thus it is necessary to standardise the relative humidity of the atmosphere in this test. Results of some value can be obtained by making the test with the apparatus over water.

Following the Basle conference it was felt that some collaborative work with French chemists was desirable. Such work, with the help of others, resulted in the following conclusions being drawn in a paper on "*pH* of Chestnut Extracts" by Dr. D. Burton:—(1) When a determination is made with the quinhydrone electrode it is impossible to find any point where a steady reading is obtained. (2) If the hydrogen electrode is thoroughly saturated before putting it into the solution of the extract, a steady reading is obtained in less than one minute. The same electrode can be used for further solutions until it ceases to be saturated with hydrogen. (3) The bubbling hydrogen electrode gives *pH* figures which rise on dilution in accordance with theory. The quinhydrone results sometimes rise and sometimes fall. (4) The quinhydrone results vary to a much greater extent than with the bubbling hydrogen electrode results. The latter agree with the glass electrode results. It is therefore considered that the quinhydrone electrode method is not accurate and is definitely unsuitable for trade requirements. The concordance given by the bubbling electrode method is further shown by results obtained in determining the effect of ageing on the *pH* of three chestnut extracts. No change in the *pH* was found after storing in the open for one year.

The British Section Committee on the Determination of *pH* is publishing a collaborative report on work with the glass electrode. This has advantages over the bubbling hydrogen electrode in that it is probably applicable to any kind of extract or tan liquor. The use of the more recent electrometer triode valve type of glass electrode was also described.

#### Sulphuric Acid in Vegetable Leather

In a paper on "Sulphuric Acid in Vegetable Leather" by Mr. F. C. Thompson and W. R. Atkin, Mr. Atkin showed that the simple equations which theoretically justify the Innes and

Atkin-Thompson methods are not strictly valid at extremely high dilutions, and that at such dilutions as are used in the Innes method, a weak acid can easily simulate a strong acid. Innes's recent adoption of a limiting *pH* of 2.9 does, to some extent, meet this difficulty and brings the method more into line with that of Atkin and Thompson. He further discussed recent work by Kubelka which demonstrates the usefulness of the Atkin-Thompson method, although not so interpreted by Kubelka himself.

In "Absorption of Water by Sole Leather" and "Wearing Properties of Leather by the Thuau Machine" by Dr. J. Gordon Parker and A. Harvey, Dr. Gordon Parker gave some notes on the experiences gained in the use of the new abrasive machine for testing the wearing properties of sole leather, and said that it could now be concluded that the results obtained were of distinct value to the trade. Six specially well-known tannages had been tested, and the same leathers were being subjected to practical wearing tests by a number of London postmen in order to ascertain any relationship between two sets of observations. Diagrams showing wear resistance curves were exhibited, and illustrated the reduction in wearing properties as the result of excessive bleaching.

A new method of measuring the water penetration of leather was described, and suggested that the method gave more practical information than either the old method of water permeability or the measurement of the amount of water by total immersion. From a study of the curves, it has been found that, apart from the initial inrush of water for the first five minutes, the absorption of the water follows the diffusion law.

The PRESIDENT stated that the committee had favourably discussed the holding, in conjunction perhaps with other societies, of a symposium on strictly scientific subjects, such as the Donnan Equilibrium and the Procter-Wilson Swelling Theory. The meeting cordially approved, and it was left with the President and Dr. C. H. Spiers (from whom the proposal originated) to deal with the matter.

### Newcastle Chemical Industry Club

#### Extended Library Facilities

Two years ago the Newcastle Chemical Industry Club showed considerable enterprise by reducing its subscription and so drawing members from a larger field. The soundness of this policy has now been fully proved. At the recent annual general meeting it was stated that a steady increase in the number of members had enabled a satisfactory financial position to be maintained, but still more valuable was the progress in drawing together the technical staffs of local industries.

The affiliation of the club library with the Northern Regional Library scheme has made the highly specialised books available to a much wider circle than the actual membership of the club. The importance of this facility has been recognised by some of the leading Tyneside firms, whose generous support has helped to secure a number of recent publications on industrial chemistry. Further, the gift of new volumes and journals from technical societies and individuals is successfully expanding the practical utility of the library.

The club's general activities have been well maintained, with new developments in several directions, including the holding of a German class and the publication of a calendar of all local technical meetings for the season.

More members are still required, and membership is worthy of the consideration of any chemists in other districts who may have occasion to visit Newcastle, as a bedroom is available at a moderate fee.

Mr. Robert Bowran, J.P., was re-elected president with the following officers:—Chairman, Mr. B. P. Hill; hon. secretary, Mr. Gilbert B. Howarth.

#### Swedish Sulphur Imports

IMPORTS of sulphur into Sweden in 1931 totalled 59,970 metric tons or about 13,800 tons less than during 1930. Reduced demand for sulphur is attributed to restrictions in production of sulphite pulp under the agreement among European manufacturers.

## News from the Allied Industries

### Soap and Candles

SEVEN EMPLOYEES OF J. L. THOMAS AND CO., LTD., the tallow melters, soap and candle manufacturers, Exeter, and the Millbay Soap Co., Ltd., Plymouth, have been presented by these associated firms with gold watches to mark the completion of fifteen years' service. The recipients are Messrs. A. H. Saw (secretary), S. Steer (Plymouth works manager), F. Parkhouse, E. F. Underhill, M. Shermer, F. H. Blackmore and W. Eveleigh. The presentations were made by Mr. G. W. Fenton, chairman of Thomas and Co., at Exeter, on Thursday, March 24, supported by Mr. C. H. Angear, chairman of the Millbay Soap Co.

### Paint and Varnish

AT THE ANNUAL MEETING of Pinchin, Johnson and Co., held on March 22, Mr. Edward Robson, the chairman, explained how the recent fiscal change had given benefit to the associated and subsidiary undertakings and had strengthened their position locally and as a whole. Mr. Robson takes an optimistic view of the company's trading prospects, and considers that the current year will show a measure of improved results consistent with the efforts made to achieve efficiency and to continue progressive. It is encouraging to learn that the initial year's business in Argentina was satisfactory, particularly as only a portion of the net earnings was distributed in dividends.

### Oil Cake and Seed Crushing

THE SPEECH of Mr. J. W. Pearson, chairman and managing director of the British Oil and Cake Mills, Ltd., at the company's general meeting held in London on March 22, was mainly concerned with the effect of the suspension of the gold standard and the 10 per cent. import duties on the British seed crushing industry. The rise in prices and increase in demand materialised before last September, while since September sterling prices have been inclined, if anything, to weaken. Mr. Pearson took the rather extreme view that sterling was so much more the world's standard than gold that the whole of the fall in gold prices since September is virtually due to gold coming into line with sterling rather than to any intrinsic influences in the gold countries themselves, and that, therefore, the protection afforded by the depreciation of sterling is largely illusory. The chief changes he expects to come from the import duties on cakes, and, to a certain extent, those on oil.

### Tanning

THE JOINT CONFERENCE of leather manufacturers and chemists, held on March 18, at Leeds, was better attended than for some years past. The acute economic pressure, as well as the difficulties the leather trade is experiencing at the moment, provided important material for discussion, while keen interest was taken in the papers read by Professor I. McCandlish, chief of the Leather Industries Department of Leeds University, and Professor T. E. Gregorv, of the London School of Economics. Professor McCandlish dealt with "Some Aspects of Chrome Upper Leather Manufacture." The questions which followed this paper showed that in the preparation of chrome leather from its raw state no two leathers employed the same formulae, and much conflict of opinion ensued over the relative effects of the different chemicals applied in gaining the best results.

ACCORDING TO A RECENT ISSUE of *East Africa*, neither the wattle-growing interests nor the leather industry in this country, appears to have realised that the Import Duties Bill must have a very important bearing on the development of the East African wattle industry, which, though a creation of recent years, has already assumed a place by no means negligible in the agricultural economy of Kenya, to the exports of which it contributed some £63,080 in 1930, the last year for which statistics are available. Hitherto the industry has suffered severely from the competition of quebracho, which will henceforth be subject to an import duty of 10 per cent.: East African and Natal wattle will, of course, enjoy that measure of advantage, which, it is to be hoped, may serve to redress the present position by which the mother country draws from foreign sources more than four-fifths of her supplies of tanning materials.

### Rubber

SEVEN RUBBER ESTATES in the Dutch East Indies are closing down and several others are substituting other crops for rubber in consequence of the rejection of the rubber restriction plan by the British and Dutch Governments.

A BILL HAS BEEN PASSED IN FRANCE authorising the Government of French Indo-China to issue a loan of 250,000,000 francs (£2,000,000 at par) to assist the rubber plantations.

### Cement Manufacture

THE PRELIMINARY FIGURES of the Fourth Census of Production covering the cement industry are complete enough and consistent enough to allow interesting comparison to be made between 1930 and 1924. The production of cement for building and engineering purposes has risen from 3,212,600 tons to 4,943,200 tons, an increase of over 53 per cent. Prices, however, have fallen during the period from an average of £2 2s. 8d. per ton in 1924 to an average of £1 9s. 10d. per ton in 1930. As a result, the total value of output of all cement has risen only from £6,925,000 to £7,525,000. Exports rose from 651,200 tons in 1924 to 1,039,900 tons in 1930; and the output available for home consumption rose from 2,790,500 tons to 4,128,000 tons. In both years, the share of the market held by British cement was rather over 94 per cent. Despite the larger output, however, the number of operatives in the industry did not rise. The full return of employment for 1930 is on a different basis from that of 1924, and is not comparable. But an estimate of totals on a comparable basis gives a decline of rather less than 2 per cent. between 1924 and 1930. There has been a distinct increase in steam turbines for the generation of electricity, but, on the whole, the use of prime movers on the works has fallen. Their place has been taken by electric machinery, driven on purchased power. The installed horse-power of this type of machinery has risen from 21,691 h.p. to 105,359 h.p., while prime movers have fallen from 90,426 h.p. to 85,665 h.p.

### Sugar Industry

THE DESSAU SUGAR REFINING WORKS, Germany, which recently took on 200 new workers, is to close down for three months as from May 1. This firm's business consisted mainly in export to England.

A LAW HAS BEEN PASSED IN SWEDEN conferring on two sugar refining concerns (Svenska Sockerfabriksaktiebolaget and Mellersta Sveriges Sockerfabriksaktiebolag) the sole right to import sugar into Sweden during the period February 23, 1932, to February 28, 1933. It is understood that no refined sugar whatever will be imported into Sweden during this period. In return for this concession, and for the authority not to charge less than a fixed minimum price for their products, the Svenska Sockerfabriksaktiebolag undertake to pay a fixed minimum scale of prices for Swedish-grown sugar beets.

THE INTERNATIONAL SUGAR CONFERENCE at Paris came to an end on Tuesday, March 22, without reaching an agreement. The conference had been sitting for ten days and the members were unable to remain in Paris any longer, but negotiations will be continued, as it is still hoped that Cuba, with whom the last word now lies, will accept proposals which have been made to her. The present position, according to a communiqué issued at the close of the conference, is that in view of the decrease in world sugar consumption, the European countries which are parties to the international sugar agreement and Peru have made proposals involving big sacrifices for them in order to effect a decisive improvement in the sugar situation, and to reconcile certain differing points of view. The proposals of the European members and Peru involved two inter-dependent propositions. The first was that Cuba should reduce her 1932 crop to 2,500,000 tons, and the second, which was conditional upon Cuba's agreeing to the first, provided that the European members and Peru would reduce their exports by the amount by which Java's exports during the year April, 1932, to April, 1933, exceeded 1,500,000 tons. Cuba's acceptance of these proposals is not yet forthcoming, but it is hoped that it will shortly be obtained, and for this purpose negotiations are to be continued between that country and the conference headquarters at The Hague. The next regular meeting of the conference will be held in Paris on June 13.



April 2, 1932

The Chemical Age

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## Letters to the Editor

*The Editor welcomes expression of opinion and fact from responsible persons for publication in these columns. Signed letters are, of course, preferred, but where a desire for anonymity is indicated this will invariably be respected. From time to time letters containing useful ideas and suggestions have been received, signed with a nom-de-plume and giving no information as to their origin. Correspondence cannot be published in THE CHEMICAL AGE unless its authorship is revealed to the Editor.*

### Corrosion-Resisting Materials

*To the Editor of THE CHEMICAL AGE.*

SIR,—In reply to "Chemical Manufacturer's" letter on the subject of acid proof stoneware and homogeneous lead-lined plant, my firm is largely interested in manufacturing chemical plant in this country, but on the other hand we are largely interested in importing speciality apparatus which we believe is superior to what is made in this country, and for which there is a demand. We import these specialities: acid proof stoneware, homogeneous lead-lined plant and special acid proof enamel plant. In each of these lines we can offer your correspondent really sound and reliable plant which will stand the test and give results—results which cannot be obtained by material offered by any of our competitors. Our D.S.F. acid proof stoneware is manufactured by the largest and best equipped works of its kind in the world. The stoneware is made in some twenty different qualities and for temperatures up to 170° C. The stoneware is acid proof without the glaze and it can be machined or ground with the greatest accuracy.

The acid proof enamel ware manufactured by Eisenwerk Kaiserslautern is made by a patent vacuum process, thus eliminating as far as possible the little pin hole defects which frequently occur when using acid proof enamel ware, and which result in failures. The homogeneous lead-lined plant made by our friends, Volkmar Hanig and Co., is carried out by a reliable process which ensures perfect adhesion of the lead to the metal. We should be very pleased if we could be of any service to your correspondent for the supply of chemical plant.

We also enclose herewith a leaflet of our drying stoves, and also of our associated works, Prachitt Bros, Ltd., of Carlisle.—Yours faithfully,

37 Peter Street,  
Manchester.

L. A. MITCHELL, LTD.

*To the Editor of THE CHEMICAL AGE.*

SIR,—One wonders whether the letter which appeared in your issue of March 12, signed "Chemical Manufacturer," is not more of a reflection on the writer of that letter than on the chemical plant manufacturers of this country. Homogeneous lead-lining has been carried out by my company for some eighteen years and no difficulties have arisen in making homogeneously lead-coated steel vessels of any kind. For instance, we have for years had large numbers of vacuum evaporators working with 27 in. vacuum, and upwards, with complete success.

The Kestner Company were the first concern in this country to regularly produce homogeneous lead-lining. At the moment, there are a number of companies working on different processes and the majority of them produce work equal to, if not better, than anything that can be obtained from the Continent. A short while back, the writer was asked to examine a number of lead-lined vessels supplied by a well-known Continental firm, which showed a large number of defects in each vessel after they had been working for only eight or nine days.

I note also the criticism of chemical stoneware. All through the War large quantities of chemical stoneware were supplied by English manufacturers and to-day we can obtain for our special requirements just as good stoneware in England as can be obtained from the Continent. If the British stoneware manufacturers are supported by the users in this country, I am convinced that they will produce just as good materials as the Continental firms, and at as satisfactory a price. It is largely a question of turnover as far as price is concerned.

—Yours faithfully,

KESTNER EVAPORATOR AND ENGINEERING CO., LTD.

J. ARTHUR REAVELL,  
Chairman

5 Grosvenor Gardens,  
Westminster, S.W.1.

## United Kingdom Fertiliser Production Statistics from the Fourth Census of Production, 1930

ACCORDING to the preliminary Report of the Fourth Census of Production, respecting returns made by the fertiliser, disinfectant, glue and allied trades, the gross output in 1930 amounted to £5,847,000, as compared with £7,695,000 in 1924. Materials used cost £3,216,000 and £4,921,000 respectively, giving a net output of £2,629,000 in 1930, as compared with one of £4,921,000 in 1924. The number of persons employed diminished from 9,661 to 8,754, so that the ultimate net output per person employed was £300 in 1930 whilst being only £287 in 1924. The power generated by prime movers decreased from 15,606 h.p. in 1924 to 12,789 h.p. in 1930; that generated by electric motors driven by purchased electricity, however, increased from 18,552 h.p. in 1924 to 23,753 h.p. in 1930.

Complete particulars of production of sulphate of ammonia in 1930 as returned to the Census of Production will not be available until the results for the coke and by-products trade and the gas industry have been aggregated. According to the *Annual Report of the Chief Inspectors on Alkali, etc., Works for the Year 1930*, the total quantity of ammonia products manufactured in that year represented the theoretical equivalent of 777,090 tons of sulphate. Of this total 53,300 tons were represented by concentrated ammoniacal liquor and the balance, 723,790 tons, consisted of sulphate, chloride, nitrate and other ammonia compounds. The figure of 777,090 tons, therefore, overstates to some extent the actual amount of sulphate of ammonia available for use. In 1924, when the total output returned to the Census of Production by all producing industries amounted to 419,750 tons, the total produc-

tion of ammonia products in terms of sulphate was reported by the Chief Inspectors of Alkali Works at 453,470 tons. In their annual Report for the year 1930-31, it is stated by the British Sulphate of Ammonia Federation, Ltd., that the production of sulphate in Great Britain in the calendar year 1930 was 673,700 tons.

The total output of superphosphates returned on schedules for the fertilisers, etc., trade at the 1930 census was 333,500 tons, and 14,900 tons were sold (or added to stock) by firms making returns on schedules for the Chemical Trades, the total, so far as recorded, being 348,400 tons. The defect caused by the exclusion of the output of small firms and of establishments in Northern Ireland may be of some importance, since 34,400 tons, or nearly 9 per cent. of the total quantity returned by all firms were produced in 1924 by establishments so excluded in 1930.

In the 1924 Census, it was estimated that the total make of simple fertilisers in the United Kingdom amounted to about 1,330,000 tons, and that, after allowing for the quantities imported and exported, a total of 1,427,000 tons was available for use in the United Kingdom. Such information as is at present available from the census returns and from trade sources suggests that the total quantity manufactured in 1930 amounted to approximately 1,600,000 tons. Exports of simple and compound manures in 1930 were 681,700 tons, and retained imports amounted to 365,800 tons. The total quantity available for use in the United Kingdom in 1930 may, therefore, be estimated provisionally as about 1,280,000 tons, representing a decline of about 10 per cent. as compared with 1924.

## From Week to Week

A NEW CHEMICAL AND PHYSICAL LABORATORY has been opened by Glenfield and Kennedy, Ltd., Kilmarnock.

THIRTY-TWO EMPLOYEES of Imperial Chemical Industries, Ltd., Billingham-on-Tees, have been presented with medals by Dr. A. Fleck, of Liverpool, on behalf of the firm in recognition of their long service.

RECENT WILLS include:—Mr. Alexander Adam Robertson, of Cressington Park, Liverpool, associated with the firm of Peter Spence and Co., chemical manufacturers, formerly with the Australian Alum Company, Runcorn, £8,008 (net personalty £7,789).

THE SPRING MEETING of the Refractory Materials Section and the Building Materials Section of the Ceramic Society will be held at Folkestone as part of the Clay Convention. Papers will be read on May 3, and on May 4 and 5 the Society will join forces with the National Federation of Clay Industries and other bodies and follow a united programme.

MR. F. K. NEATH has resigned his position with the British Cast Iron Research Association to join the Keighley Laboratories, Ltd., Keighley, Yorkshire. Mr. Neath has occupied an important position with the British Cast Iron Research Association for the past eight years, and is the hon. secretary of the Birmingham, Coventry and West Midlands Branch of the Institute of British Foundrymen. He was responsible for the organisation of the last annual conference of the Institute.

MR. BERNARD MASON, who was elected president of the West Cumberland Society of Chemists and Engineers, at the annual meeting at Workington last week, devoted his presidential address to a description of the new mechanically charged blast furnace recently put into operation at the Derwent Works, Workington. The following officers were elected: vice-president, Mr. Swales; treasurer, Mr. Wyld; secretary, Mr. A. Dodd; council, Messrs. D. R. Wattleworth, A. B. Coles, J. McGowan, J. E. Christopher, J. Jones, A. Purdie and J. Todd.

AT THE RECENT ANNUAL MEETING of the Finsbury Technical College Old Students' Association, the following officers were elected:—President, Mr. E. G. Walker; immediate past president, Mr. H. G. Knight; members of Council, Messrs. W. J. Jeffery, H. D. Symons, and L. M. Clark; treasurer, Mr. W. B. Thompson; secretary, Mr. F. R. C. Rouse, 15 Clifton Gardens, Golders Green, N.W.11. The annual dinner on March 12 was attended by 94 members and guests, the latter including Mr. W. M. Mordey, Mrs. Mordey, Dr. Scoble, Professor Catterson-Smith, and Mr. C. R. Darling. The dinner was followed by a musical programme.

THIEVES who broke into the strong room of Gale and Co., chemical manufacturers, Bouverie Street, London, on March 26, cut their way through a concrete wall which is a foot thick and reached the room in which there were many secret chemical formulae, as well as a safe containing about £100. Until a careful search is made of the contents of the room it will not be possible to say whether any of the firm's secret processes have been taken. The thieves broke open the safe and stole the money, and left the room in a state of disorder. From the way in which the wall had been cut the theft is believed to be the work of an experienced gang of safe breakers.

THE CO-ORDINATION OF SCIENTIFIC TERMINOLOGY has been considered by a committee which met recently at the International Institute of Intellectual Co-operation. The committee consisted of Professor Cabrera (Madrid), chairman; Professor Cotton (Paris), representing the International Union of Physics; Professor Willstätter (Munich); Professor Lowry (Cambridge), representing the International Union of Chemistry; Professor Selys-Longchamps and Dr. Ledoux (Brussels), representing the International Union of Biological Sciences; and Professor Lombardi (Rome), representing the International Union of Electro-technics. The committee unanimously recognised the importance of unifying scientific and technical terminology common to several branches of science, and invited the International Institute to undertake this work in conjunction with the international organisations concerned.

THE PORT TALBOT PATENT FUEL WORKS is to restart operations within the next few weeks after being idle for a long time.

SPEAKING AT THE ANNUAL DINNER of the Works Council of Imperial Chemical Industries, Ltd., at Billingham-on-Tees, Dr. A. Slade, a director, said that he believed the worst of the depression was over. There had been a definite improvement in trade recently and he thought this would be maintained.

THERE WILL BE FIVE NOBEL AWARDS this year, the Physics Prize having been held over from last year. Literature, medicine and chemistry will carry one award each, with two for physics. The funds of the Nobel Foundation now exceed 45,000,000 kroner (approximately £2,250,000), and the amount of each prize will be 171,753 kroner—approximately the same as last year.

THE NORTH IRISH PHARMACISTS' ASSOCIATION and the Ulster Retail Drug Trade Association have been wound up and a new organisation—the Ulster Retail Drug Trade Association—has been formed under the presidency of Mr. A. E. Davis. It has been generally felt in Northern Ireland for some time that the work of the two associations overlapped somewhat and it was thought that their objects would be more efficiently and more economically achieved by the uniting of the two bodies. Mr. W. J. Blair has been appointed secretary to the new Association.

LECTURES ON POWER PLANT, Diesel and semi-Diesel engines, will be given by Mr. E. L. Bass, A.M.I.A.E., at the Sir John Cass Technical Institute, London, on Tuesday evenings, commencing April 12, at 6.45 p.m. This course, which will consist of seven lectures, has been arranged for those engaged in the technical branches of the petroleum, chemical and metallurgical industries, and will also be suited to the requirements of those associated with the engineering industry, especially those engaged in transport. Questions will be invited after each lecture. The fee for the course is 7s. 6d.

DR EMIL HATSCHKE, lecturer on colloids at the Sir John Cass Technical Institute, London, has consented to give an address at the tenth Symposium on Colloid Chemistry, which will be held in the newly constructed National Research Laboratories at Ottawa, June 16 to 18. An active local committee under the chairmanship of H. M. Tory, president of the National Research Council, is in charge of arrangements. G. S. Whitby, director of the Division of Chemistry, National Research Laboratories, is head of the general and finance committee.

A COURSE OF THREE LECTURES on "The Role of Statistical Method in Industrial Standardisation" will be given by Dr. W. A. Shewhart at University College, Gower Street, London, on May 3, 5 and 6, at 5.30 p.m. Dr. Shewhart is a member of the technical staff of the Bell Telephone Laboratories, New York, and in these lectures an attempt will be made to outline the present status of the applications of modern statistics. At the first lecture the chair will be taken by Sir F. E. Smith, secretary of the Department of Scientific and Industrial Research. A detailed syllabus of the lectures may be obtained on application to the Academic Registrar, University of London, S.W.7.

THE STANDARD OIL CO. (INDIANA) has started the construction of the world's largest and most up-to-date cracking unit in its refinery at Whiting. It is designed to handle approximately 19,000 barrels of crude oil per day. The crude oil is distilled and cracked in a single unit and the product is to be over 70 per cent. of high anti-knock gasoline, with fuel oil and gas as the only by-products. It marks the culmination of many years of research and development work by the Standard Oil Co., which pioneered in the development of the cracking process for making gasoline. Some idea of the magnitude of the unit may be obtained from the fact that the volume of one of the two furnaces is 74,000 cubic feet, and it is planned to release approximately 200,000,000 B.Th.U. per hour within this main furnace. The unit is being constructed by The M. W. Kellogg Co., of New York City.



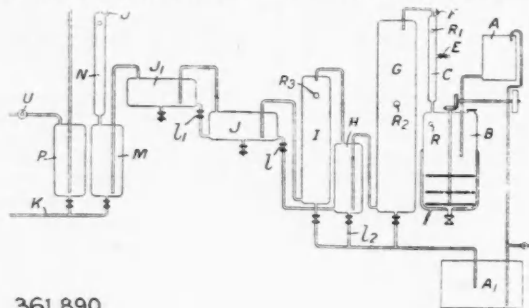
## Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2. at 1s. each.

### Abstracts of Accepted Specifications

301,890. OXIDATION PRODUCTS OF COAL; FERTILISERS. M. F. Carrol, 41 Fairland Road, Stratford, and A. Boake, Roberts and Co., Ltd., Carpenters Road, Stratford.

Powdered coal, peat, anthracite or lignite is treated in a vessel B with nitric acid from a tank A and water from an inlet F. Nitric oxide is evolved and passes through a tower C filled with broken coke, where it is oxidised with air, the oxidation being completed in a chamber G. The gases then



361,890

pass to a bubbler H containing nitric acid from a previous operation, which is decomposed and the nitric oxide again oxidised in a chamber I. The oxides pass to bubblers J, J<sub>1</sub> containing nitric acid, and all the bubblers are connected by pipes L, L<sub>1</sub>, L<sub>2</sub> to a tank A<sub>1</sub> which supplies tank A. Strong nitric acid is recovered in bubbler H, and weaker in bubbler J<sub>1</sub>. Each bubbler is replenished with weaker acid from the next bubbler. Gases from bubbler J<sub>1</sub> are absorbed in alkali in bubblers M, P, and the solution is drawn off and crystallised to obtain fertilisers.

362,462. ACETIC ANHYDRIDE. C. F. Boehringer and Soehne Ges., Waldhof, Mannheim.

A catalyst for the production of acetic anhydride by heating acetic acid vapour is obtained by heating silica or alumina gel to incipient sintering, or by treating with a caustic alkali such as ammonia, or with an acid such as hydrochloric, or by introducing carbon into the pores and then burning it out. Examples describe the use of silica gel obtained from silicon chloride and water, and treated with ammonia; silica gel from water-glass and hydrochloric acid and treated with hydrochloric acid; and alumina gel from aluminium sulphate and ammonia and treated with hydrofluoric acid. In addition to the above, other catalysts having less than the maximum surface development may be used.

362,593. ETHERS. J. Y. Johnson, London. (*I. G. Farbenindustrie.*)

Alkyl sulphuric acids are heated with water while adding steam, with or without ammonia. The ether is distilled off and the residue of alkyl sulphuric acid, sulphuric acid, alcohol and water is fractionally distilled. The vapour is partly freed from water in another column, and the remaining concentrated aqueous alcohol vapour is treated with fresh alkyl sulphuric acid above 100° C. The starting material may be obtained by absorbing ethylene or other olefines in sulphuric acid, and may contain a high proportion of dialkyl sulphate.

361,856. CHEMICAL APPARATUS FOR DESTRUCTIVE HYDROGENATION. J. Y. Johnson, London. (*I. G. Farbenindustrie.*)

The apparatus is constructed of, or coated with, an iron alloy free from nickel and containing substituted amounts of chromium and molybdenum, e.g., chromium 3—18 per cent. and molybdenum 0.2—3 per cent.

363,550. SOLUBILISING PHOSPHATES. Soc. Anon. pour le traitement des Mineraux Alumino Potassiques, 2 Rue du Midi, Lausanne.

Molten natural calcium phosphate is added to an aqueous solution of phosphoric acid containing 300-550 grms P<sub>2</sub>O<sub>5</sub> per litre to obtain phosphatic fertilisers consisting of mono- or di-calcium phosphate, which may contain also complex phosphates.

361,903. TREATING IRON-BEARING SULPHIDE ORES. Sulphide Corporation, 7 West 10th Street, Wilmington, U.S.A.

The ores are treated in finely-divided form with dilute chlorinating gases to form ferrous chloride, and vapour of liberated sulphur is removed free from heavy metal chlorides. The ferrous chloride is oxidised with preheated air and the ferric chloride and nitrogen returned to the chlorination step. The temperatures are such that no bulk fusion of the solids takes place.

363,436. NITRIC ACID. H. Frischer, 35 Budapeststrasse, Berlin.

Ammonia oxidation products are converted into nitric acid of at least 50 per cent. concentration in an oxidation chamber cooled to 10°-30° C. Acid of 60-70 per cent. strength is obtained at 10° C.

363,776. DEHYDRATION CATALYSTS. Howards and Sons, Ltd., J. W. Blagden, and G. C. H. Clarke, Uphall Works, Ilford.

A carrier such as pumice or coke is soaked in a solution of a mixture of salts decomposing below 500° C., e.g., copper and magnesium nitrates, or copper and chromium nitrates. The salts are then converted into oxides by heating.

### Specifications Accepted with Date of Application

368,718. Pure rubber hydrocarbons, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 8, 1930.

368,777. Anodes for the electrolysis of molten salts, Magnesium production Co., Ltd. Dec. 4, 1929.

368,780. Refinement of magnetic metals and alloys. W. S. Smith, H. J. Garnett and W. F. Randall. Dec. 6, 1930.

368,782. Purification of acetylene. J. Y. Johnson. (*I. G. Farbenindustrie.*) Dec. 9, 1930.

368,783. Regeneration of caustic alkali waste liquors, and apparatus therefor. Asahi Kasei Kaisha, Ltd. Dec. 17, 1929.

368,789. Condensation products of the anthraquinone series, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 11, 1930.

368,824. Anthraquinone compounds, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 10, 1930.

368,829. 1:4-diaminoanthraquinone, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 10, 1930.

368,835. Acetic anhydride from ethylidene diacetate, Production of. Canadian Electro-Products Co., Ltd. Dec. 12, 1929.

368,843. Aluminium-silicon alloys. Aluminium, Ltd. Jan. 15, 1930.

368,868. Ethyl ether, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Dec. 18, 1930.

368,869. Fatty acids, Production of—by oxidation of hydrocarbons. J. Y. Johnson. (*I. G. Farbenindustrie.*) Dec. 18, 1930.

368,884. Monoacyl-diamino-acridines, Manufacture of. A. Carpmael. (*I. G. Farbenindustrie.*) Dec. 30, 1930.

368,906. Hydrogenation of fatty acids, and apparatus therefor. Technical Research Works, Ltd., and E. J. Lush. Jan. 13, 1931.

368,930. 1:2:5:6-diphthaloyl-naphthalene and halogen substitution products thereof. I. G. Farbenindustrie. Jan. 31, 1930.

Addition to 353,113.

368,935. Aliphatic alcohols, Manufacture of. Distillers Co., Ltd., W. P. Joshua, H. M. Stanley, and J. B. Dymock. Feb. 5, 1931.

368,955. Valuable liquid products from tars, petroleum, and the like containing asphaltic or resinous matter, Manufacture of. J. Y. Johnson. (*I. G. Farbenindustrie.*) Feb. 23, 1931.

369,027. Fertilizers, Manufacture of. E. Urbain. Nov. 4, 1930.

Addition to 10779 1931.

369,046.—Cracking oil, Method of. Gulf Refining Co. May 24, 1930.

369,094. Non-ferrous alloys. Scovill Manufacturing Co. Apr. 6, 1931.

369,117. Esters of oxyacylamino-benzo-arsonic acids, Manufacture of. (*I. G. Farbenindustrie.*) July 10, 1930. Addition to 347,083.

369,118. Aqueous formic acid, Process for concentrating. Lonza Elektrizitätswerke und Chemische Fabriken. July 18, 1930.

369,120. Recovery of nickel and cobalt or pure salts thereof. Norddeutsche Affinerie. Sept. 9, 1930.

369,124. Anhydrous fused caustic soda, Production of. I. G. Farbenindustrie. Nov. 4, 1930.

369,141. Ethylene glycol, Manufacture of. K. E. Skärblom. Aug. 26, 1931.

369,146. Tri-sodium phosphate, Production of. Chemische Fabrik Budenheim. Sept. 24, 1930.

369,154. Catalytic oxidation of ammonia. L. J. A. Marmier. Nov. 4, 1930.

369,162. Beryllium compounds, Recovery of—from beryllium-bearing minerals. C. Adamoli. Jan. 16, 1931.

## Applications for Patents

[In the case of applications for patents under the International Convention, the priority date (that is, the original application date abroad which the applicant desires shall be accorded to the patent) is given in brackets, with the name of the country of origin. Specifications of such applications are open to inspection at the Patent Office on the anniversary of the date given in brackets, whether or not they have been accepted.]

- Boake, Roberts, & Co., Ltd., A. Carroll, M. F., and Ward, S. G. Wet oxidation of coal &c. 7686. March 15.
- Böhme Akt.-Ges., H. T. Production of primary alcohols and aldehydes. 7911. March 17. (Germany, July 15, '31.)
- Productions of alcohols and carbonyl compounds. 8004. March 17. (Germany, Nov. 14, '31.)
- Corpmael, A. Manufacture of products containing nitrogen. 7529. March 14.
- (I. G. Farbenindustrie). Manufacture of azo dyestuffs, &c. 7687. March 15.
- Geigy Akt.-Ges., J. R. Manufacture of condensation products of high molecular weight. 7866. March 16. (Germany, March 16, '31.)
- Groves, W. W. (I. G. Farbenindustrie). Manufacture of physiologically-active substances. 7865. March 16.
- Manufacture of insoluble azo dyestuffs on the fibre. 7992. March 17.
- Higgins, E. B. Degradation hydrogenation of coals, tars, &c. 7596. March 15.
- Hirsch, N. V. Chemical concentration of phosphate. 7971. March 17.
- Johnson, J. Y. (I. G. Farbenindustrie). Manufacture of water-soluble azo dyestuffs. 7830. 7831. 7832. March 16.
- Manufacture of products of anthra-pyrimidine series. 7979. March 17.
- Manufacture of insoluble azo dyestuffs on the fibre. 7992. March 17.
- I. G. Farbenindustrie Akt.-Ges. Manufacture of vat dyestuffs. 7530. March 14. (Germany, March 12, '31.)
- Dehydrating organic liquids. 7667. March 15. (Germany, March 30, '31.)
- Manufacture of aliphatic halogenated alcohols. 8264. March 19. (Germany, March 21, '31.)
- Imperial Chemical Industries, Ltd. Coating aluminium &c. 7725. March 15.
- Treatment of waxes. 8010. March 17.
- Stripping and discharging dyed textiles. 8238. March 19.
- (Du Pont de Nemours & Co.) Manufacture of leather cloth &c. 8098. 8099. March 18.
- Silica Gel Corporation. Manufacture of adsorptive or catalytic gels. 7692. March 15. (United States, March 18, '31.)
- Ziegler, K. Manufacture of unsaturated substituted tertiary acetamides. 7552. March 14. (Germany, May 13, '31.)
- Alkylating of acid nitriles. 7791. March 16. (Germany, May 7, '31.)

## A New Fertiliser Development in France

ACCORDING to a recent issue of the *Fertiliser, Feeding Stuffs and Farm Supplies Journal*, a new method is being introduced in France for the preparation of a phosphate fertiliser, in which the transformation of raw calcium phosphate into soluble phosphate is complete. In the process lead chloride is used as an intermediary reagent in a hydrochloric acid solution which, with calcium phosphate, gives lead chlorophosphate and calcium chloride. The lead chlorophosphate treated with nitric acid gives lead nitrate, and the phosphoric acid remains in solution in the nitric acid medium. The lead nitrate is removed by treating with potassium chloride and a mixture of potassium nitrate, and lead chloride is thus obtained. The latter is used again in the cycle of operations, and at the end a mixture containing nitric acid and phosphoric acid remains. This mixture, when saturated with ammonia, gives a soluble fertiliser, in which the whole of the phosphoric acid is in a soluble state. It is reported that the method has already been put into operation on a semi-industrial basis.

## Proceedings of Canadian Fuel and Coal Symposium

THE proceedings of the Symposium on Fuel and Coal, held in October and November, 1931, under the auspices of the Department of Mechanical Engineering of McGill University, Montreal, Canada, have been issued as a 474-page book, price \$1.50. The papers include discussions on origin, physical character, and distribution of Canadian coals, chemical composition and classification of Canadian coals, gasification, high-temperature carbonisation, low-temperature carbonisation, relation of petroleum and its allied products to coal, relation of electricity to coal, and economic aspects.

## Bibliography of Bibliographies on Chemistry

THE National Research Council announces the publication of a Second Supplement to the *Bibliography of Bibliographies on Chemistry and Chemical Technology* covering the period 1929-1931. The original work (Bulletin 50) covered the period 1900-1924 and contained about 10,000 bibliographies classified under 2,400 headings. The first supplement (Bulletin 71) covered the period 1924-1928 and contained about 4,000 bibliographies under 1,050 headings. The second supplement (Bulletin 86) covers the period 1929-1931 and contains approximately 3,300 bibliographies under 950 headings. As the title indicates, this work is a compilation of bibliographies published as separates, or at the end of books or magazine articles, or as footnotes to the same, on the numerous aspects of pure and applied chemistry. Each entry gives name of author or compiler, title and place of publication. The majority of the entries state the number of references, thus giving an indication of the completeness of the particular bibliography. The entries are classified under the proper subject-headings, alphabetically arranged. The duplication of individual entries has been largely avoided by the liberal use of cross references. These bulletins may be obtained from the Publication Office, National Research Council, Washington, D.C., at the following prices:— Bulletin 50, \$2.50; Bulletin 71, \$1.50; Bulletin 86, \$1.50. The complete set can be supplied for \$4.00.

## Activity of Nickel and Copper in Catalysis

RESULTS of a study of the adsorption of oxygen at 0° C. on catalytically active nickel and copper surfaces are summarised in a paper by W. W. Russell and O. C. Bacon which appeared in the February issue of the *Journal of the American Chemical Society*. It is reported that relatively large amounts of this gas are rapidly and irreversibly taken up with a considerable evolution of heat. Molar heats of oxygen adsorption of the order of 98,000 cal. and higher, and 82,000 cal., have been obtained for promoted nickel and promoted copper, respectively. A catalytically active surface capable of again adsorbing relatively large amounts of oxygen at 0° with only moderately reduced thermal effects, is obtained simply by heating in a suitable temperature range, a surface previously poisoned by saturation with oxygen at 0°. Evidence is advanced indicating that heating causes a change of adsorbed oxygen to stable oxide. The amounts of oxygen taken up and the magnitudes of the heats of oxygen adsorption classify nickel and copper both promoted and unpromoted in their proper relative positions as catalysts. Additional light is thrown upon the function of a promoter of the irreducible oxide type. Evaluation of the activity of copper catalysts, on the one hand by reaction velocity measurements, and on the other by heats of oxygen adsorption and oxygen adsorbing capacity, indicates that relations exist between these properties.

## Import Duties Advisory Committee

THE Import Duties Advisory Committee have received a considerable number of inquiries as to their course of procedure and as to the form in which representations, either in regard to the addition of articles to the free list under the Import Duties Act, or in regard to the imposition of additional duties, should be submitted to them. They desire to point out that the power to add articles to the free list is limited during the first six months of operation of the Act to cases of special urgency, while additional duties can only be imposed "in respect of goods of any class or description which are chargeable with the general *ad valorem* duty, and which, in their opinion, are either articles of luxury or articles of a kind which are being produced, or are likely within a reasonable time to be produced, in the United Kingdom in quantities which are substantial in relation to United Kingdom consumption." It will, therefore, be of great assistance to the Committee if applicants will pay attention to these limiting conditions.

## The Chilean Copper Situation

IN view of the proposal of the United States to put an import duty on copper imported from countries that tax the importation of copper bars or sheets, the Chilean Government has submitted to Congress a proposal for the suppression of the present duties on copper bars and sheets, in order that no obstacles may be raised in the United States against the importation of Chilean copper.

## Weekly Prices of British Chemical Products

The following notes on the chemical market conditions in Great Britain are based on direct information supplied by the British manufacturers concerned, and unless otherwise qualified the figures quoted apply to fair quantities, net and naked at makers' works. Where no locality is indicated, the prices are general for the United Kingdom. Particulars of the London chemical market are specially supplied to THE CHEMICAL AGE by R. W. Greeff and Co., Ltd., and Chas. Page and Co., Ltd., and those of the Scottish chemical market are specially supplied by Chas. Tennant and Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

NOTWITHSTANDING the holidays there has been a fairly active demand for chemical products in London. The coal tar products market remains inactive, and there is little or no alteration in prices to report. Business has opened quietly on the Manchester chemical market after the holidays, and although there has been a fairly general resumption of deliveries fresh orders this week have been only on a very moderate scale. Some anxiety is felt locally as to the possibility of labour trouble in the cotton trade, with its attendant disorganisation of operations in the allied industries. In the meantime, the majority of chemical prices are well held, but in odd instances there are indications of slight reaction from the highest points that have been touched recently. In Scotland, business has been very quiet during the past week on account of the Easter holidays.

### General Heavy Chemicals

ACETATE OF LIME.—MANCHESTER: Brown, £7 10s. per ton; grey, £11.  
 ACETONE.—LONDON: £65 to £68 per ton; SCOTLAND: £66 to £68 ex wharf, according to quantity.  
 ACID, ACETIC.—Tech. 40%, £19 15s. per ton d/d address U.K. in casks. LONDON: Tech. 80%, £37 5s.; pure 80%, £38 5s.; 60% £28 10s.; tech. 40%, £19 15s. SCOTLAND: Glacial 98/100%, £48 to £50; pure 80%, £38 5s.; technical 80%, £37 5s. d/d buyers' premises Great Britain. MANCHESTER: 80% commercial, £39; tech. glacial, £52.  
 ACID, BORIC.—SCOTLAND: Granulated commercial, £26 10s. per ton; B.P. crystals, £35 10s.; B.P. powder, £36 10s. in 1-cwt. bags d/d free Great Britain in one-ton lots upwards.  
 ACID, CHROMIC.—11d. per lb., less 2½% d/d U.K.  
 ACID, CITRIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 2d., less 5%. MANCHESTER: 1s. 2d.  
 ACID, FORMIC.—LONDON: £50 to £51 per ton. \*£52.  
 ACID, HYDROCHLORIC.—Spot, 3s. 9d. to 6s. carboy d/d according to purity, strength and locality. SCOTLAND: Arsenical quality, 4s.; dearsenicated, 5s. ex works, full wagon loads.  
 ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £23 10s. per ton; 50% by weight, £27 10s.; pale tech., 50% by vol., £27; 50% by weight, £32; 80% by weight, £52; edible, 50% by vol., £40. One-ton lots ex works, barrels free.  
 ACID, NITRIC.—80° Tw. spot, £20 to £25 per ton makers' works, according to district and quality. SCOTLAND: 80°, £23 ex station full truck loads.  
 ACID, OXALIC.—LONDON: £50 per ton in casks, £51 10s. in kegs, \*£52 in casks d/d. SCOTLAND: 98/100%, £50 to £53 ex store. MANCHESTER: £2 10s. per cwt., ex store.  
 ACID, SULPHURIC.—Average prices f.o.r. British makers' works, with slight variations owing to local considerations: 140° Tw. crude acid, £3 per ton; 168° Tw. arsenical £5 10s.; 168° Tw. non-arsenical, £6 15s. SCOTLAND: 144° quality, £3 12s. 6d.; 168°, £7; dearsenicated, 20s. per ton extra.  
 ACID, TARTARIC.—1s. 1d. per lb. LONDON: 1s. 1d. to 1s. 1½d., less 5%. SCOTLAND: B.P. crystals, 1s. 1½d. to 1s. 2d. less 5% carriage paid. MANCHESTER: 1s. 1½d.  
 ALUM.—SCOTLAND: Lump potash, £9 per ton ex store.  
 ALUMINA SULPHATE.—LONDON: £8 15s. to £9 10s. per ton according to quality and quantity. \*£8 10s. SCOTLAND: £8 to £8 10s. ex store.  
 AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.  
 AMMONIA, LIQUID.—SCOTLAND: 80°, 2½d. to 3d. per lb. d/d, according to quantity.  
 AMMONIUM CARBONATE.—SCOTLAND: Lump, £36 per ton; powdered, £38, packed in 5-cwt. casks d/d U.K. stations or f.o.b. U.K. ports.  
 AMMONIUM CHLORIDE.—£37 to £45 per ton, carriage paid. LONDON: Fine white crystals, £19 to £20. (See also Sal ammoniac.)  
 AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton, carriage paid according to quantity. (See also Sal ammoniac.)  
 AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.  
 ANTIMONY OXIDE.—SCOTLAND: Spot £29 per ton, c.i.f. U.K. ports.  
 ANTIMONY SULPHIDE.—Golden 6½d. to 1s. 1½d. per lb.; crimson, 1s. 4d. to 1s. 6d. per lb. according to quality.  
 ARSENIC.—LONDON: £24 10s. c.i.f. main U.K. ports for imported material; Cornish nominal, £26 10s. f.o.r. mines. SCOTLAND: White powdered £27 ex wharf; spot, £27 10s. ex store. MANCHESTER: White powdered Cornish, £26 to £27 at mines.  
 ARSENIC SULPHIDE.—Yellow 1s. 6d. to 1s. 8d. per lb.

BARYTES.—£7 10s. to £9 per ton according to quality.  
 BARIUM CHLORIDE.—LONDON: £11 10s. per ton. SCOTLAND: £11 5s. in casks, ex store.  
 BISULPHIDE OF LIME.—£7 10s. per ton f.o.r. London, packages free.  
 BLEACHING POWDER.—Spot 35/37% £7 10s. per ton d/d station in casks, special terms for contract. SCOTLAND: £8 15s. in 5/6 cwt. casks.  
 BORAX, COMMERCIAL.—Granulated £15 10s. per ton, powder £17, packed in 1-cwt. bags, carriage paid any station Great Britain. Prices are for 1-ton lots and upwards.  
 CADMIUM SULPHIDE.—3s. 6d. to 3s. 9d. per lb.  
 CALCIUM CHLORIDE.—Solid 70/75% spot £5 5s. to £5 15s. per ton d/d station in drums. SCOTLAND: £5 5s. to £5 15s., according to quantity and point of delivery.  
 CARBON BISULPHIDE.—£30 to £32 per ton, drums extra.  
 CARBON BLACK.—4½d. to 5½d. per lb., ex wharf.  
 CARBON TETRACHLORIDE.—£45 to £55 per ton, drums extra.  
 CHROMIUM OXIDE.—10d. to 10½d. per lb. according to quantity d/d U.K. Green 1s. 2d. per lb.  
 CHROMETAN.—Crystals 3½d. per lb. Liquor £19 10s. per ton d/d U.K.  
 COPPERAS GREEN.—SCOTLAND: £3 15s. per ton, f.o.r., or ex works.  
 CREAM OF TARTAR.—LONDON: £5 3s. per cwt.  
 DIPHENYLGUANIDINE.—2s. 6d. per lb.  
 FORMALDEHYDE.—LONDON: 28s. 6d. to 29s. 6d. per cwt. \*30s. SCOTLAND: 40%, £28 per ton ex store.  
 HYDROGEN PEROXIDE.—LONDON: \*100 vols. 10d. per lb.  
 INDIARUBBER SUBSTITUTES.—White, 4d. to 5½d. per lb.; Dark, 4d. to 4½d.  
 LAMPBLACK.—£46 to £50 per ton.  
 LEAD ACETATE.—LONDON: White £42 to £44 per ton. Brown £1 per ton less. \*£43 and £42 respectively ex wharf London. SCOTLAND: White Crystals £42 to £44 c.i.f. U.K. ports. Brown £1 per ton less. MANCHESTER: White, £39; Brown, £36 10s.  
 LEAD NITRATE.—LONDON: £28 to £29 per ton; MANCHESTER: £29.  
 LEAD, RED.—SCOTLAND: £28 10s. per ton d/d buyer's works.  
 LEAD, WHITE.—SCOTLAND: £40 per ton carriage paid.  
 LITHOPONE.—30%, £20 to £22 per ton.  
 MAGNESITE.—SCOTLAND: Ground Calcined £9 per ton ex store.  
 METHYL SALICYLATE.—1s. 4½d. to 1s. 6½d. per lb. net, according to quantity.  
 METHYLATED SPIRIT.—61 O.P. Industrial 1s. 8d. to 2s. 3d. gal. Pyridinised Industrial, 1s. 10d. to 2s. 5d. Mineralised, 2s. 9d. to 3s. 3d. 64 O.P. 1d. extra in all cases. Prices according to quantities. SCOTLAND: Industrial quality 64 O.P., 1s. 8d. to 2s. 3d.  
 NICKEL AMMONIA SULPHATE.—£38 per ton d/d.  
 NICKEL SULPHATE.—£38 per ton d/d.  
 PHENOL.—LONDON: \*Official price, 5½d. to 6½d. per lb.; in some directions higher prices are being asked and obtained.  
 PIPERIDINE RUBBER ACCELERATORS.—P.P.D., 10s. 6d. to 11s. 6d.; Z.P.D., 7s. to 7s. 6d.; L.P.D., 6s. 6d. to 7s.; P.T.D., 9s. 8d. to 10s. 4d.; C.P.D., 8s. 3d. to 8s. 10d. S.P.D., 8s. 1d. to 8s. 7d. Superac Standard 7s. Superac Z 3s. 6d.  
 POTASH CAUSTIC.—£30 to £33 per ton. LONDON and MANCHESTER: £40 to £42.  
 POTASSIUM BICHROMATE.—Crystals and Granular, 5d. per lb. net d/d U.K. Discount according to quality. Ground, 5½d. LONDON: 5d. per lb. with usual discounts for contracts. SCOTLAND: 5d. d/d U.K. or c.i.f. Irish Ports with allowance for contracts. MANCHESTER: 5d.  
 POTASSIUM CARBONATE.—SCOTLAND: 96/98% spot £28 per ton ex store. LONDON: £32 to £33 10s. MANCHESTER: £30.  
 POTASSIUM CHLORATE.—3½d. per lb. export London in 1-cwt. kegs. LONDON: £37 per ton. SCOTLAND: 99½/100% powder, £34. MANCHESTER: £35 to £36.  
 POTASSIUM CHROMATE.—6½d. per lb. d/d U.K.  
 POTASSIUM NITRATE.—SCOTLAND: Refined Granulated £28 per ton c.i.f. U.K. ports. Spot £30 per ton ex store.  
 POTASSIUM PERMANGANATE.—LONDON: 9d. per lb. \*8½d. ex store. SCOTLAND: B.P. crystals, 8½d. MANCHESTER: Commercial, 8d.; B.P., 8½d.  
 POTASSIUM PRUSSIAN.—LONDON: 8½d. per lb. SCOTLAND: Yellow spot material, 8½d. ex store. MANCHESTER: Yellow, 8½d.  
 SACCHARIN.—43s. 6d. per lb. duty paid, with usual rebates.  
 SALAMONNIAC.—First lump spot, £42 17s. 6d. per ton d/d address in barrels.  
 SODA ASH.—58% spot, £6 per ton f.o.r. in bags, special terms for contracts.

\* Prices quoted by other manufacturers.



**SODA, CAUSTIC.**—Solid 76/77° spot £14 10s. per ton d/d station. SCOTLAND: Powdered 98/99% £17 10s. in drums, £18 15s. in casks. Solid 76/77% £14 10s. in drums. 70/72% £14 12s. 6d. carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less. MANCHESTER: £12 15s. to £14 contracts.

**SODA CRYSTALS.**—Spot £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

**SODIUM ACETATE.**—97 98%, £21 per ton; LONDON: £21 10s. to £22.

**SODIUM BICARBONATE.**—Refined spot £10 10s. per ton d/d station in bags. SCOTLAND: Refined recrystallised £10 10s. ex quay or station. MANCHESTER: £10 10s.

**SODIUM BICHRIMATE.**—Crystals cake and powder 4d. per lb. net d/d U.K. discount according to quantity. Anhydrous 5d. per lb. LONDON: 4d. per lb. with usual discounts for contracts. SCOTLAND: 4d. delivered buyer's premises with concession for contracts. MANCHESTER: 4d. less 1 to 3½% contracts, 4d. spot lots.

**SODIUM BISULPHITE POWDER.**—60/62%, £16 10s. per ton d/d 1-cwt. iron drums for home trade.

**SODIUM CARBONATE (SODA CRYSTALS).**—SCOTLAND: £5 to £5 5s. per ton ex quay or station. Powdered or pea quality 7s. 6d. per ton extra. Light Soda Ash £7 ex quay, min. 4-ton lots with reductions for contracts.

**SODIUM CHLORATE.**—2½d. per lb. LONDON: £30 per ton. \*£32 10s. MANCHESTER: £32 to £33.

**SODIUM CHROMATE.**—3½d. per lb. d/d U.K.

**SODIUM HYPOSULPHITE.**—SCOTLAND: Large crystals English manufacture £9 5s. per ton ex stations, min. 4-ton lots. Pea crystals £15 ex station 4-ton lots. MANCHESTER: Commercial, £9 5s.; photographic, £15 to £15 10s.

**SODIUM NITRITE.**—Spot £19 to £22 per ton d/d station in drums.

**SODIUM PERBORATE.**—LONDON: \*10d. per lb.

**SODIUM PHOSPHATE.**—£13 to £15 per ton f.o.r. London casks free. LONDON: Dibasic, £13 per ton. MANCHESTER: £13 10s.

**SODIUM PRUSSIAN.**—LONDON: 5d. to 5½d. per lb. SCOTLAND: 5d. to 5½d. ex store. MANCHESTER: 5d. to 6d.

**SODIUM SILICATE.**—140° Tw. Spot £8 5s. per ton d/d station returnable drums.

**SODIUM SULPHATE (GLAUBER SALTS).**—£4 2s. 6d. per ton d/d. SCOTLAND: English material £3 15s.

**SODIUM SULPHATE (SALT CAKE).**—Unground Spot £3 15s. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 2s. 6d.

**SODIUM SULPHIDE.**—Solid 60/62% Spot £10 15s. per ton d/d in drums. Crystals Spot £7 15s. per ton d/d in casks. SCOTLAND: For home consumption, Solid 60/62%, £10 5s.; broken 60/62%, £11 5s.; crystals, 30/32%, £8 2s. 6d. d/d buyer's works on contract, min. 4-ton lots. Spot solid 5s. per ton extra. Crystals, 2s. 6d. per ton extra. MANCHESTER: Concentrated solid, 60/62%, £11 10s.; commercial, £8 5s.

**SODIUM SULPHITE.**—Pea crystals spot, £13 10s. per ton d/d station in kegs. Commercial spot £9 10s. d/d station in bags.

**SULPHATE OF COPPER.**—MANCHESTER: £18 to £18 10s. per ton f.o.b.

**SULPHUR.**—£12 5s. to £15 15s. per ton. SCOTLAND: Flowers, £12 10s.; roll, £12 10s.; rock, £9. Ground American, £12 ex store.

**SULPHUR CHLORIDE.**—5d. to 7d. per lb., according to quality.

**SULPHUR PRECIP.**—B.P. £55 to £60 per ton according to quantity. Commercial, £50 to £55.

**VERMILION.**—Pale or deep, 6s. 4d. per lb.

**ZINC CHLORIDE.**—SCOTLAND: British material, 98%, £18 10s. per ton f.o.b. U.K. ports.

**ZINC SULPHATE.**—LONDON and SCOTLAND: £12 per ton.

**ZINC SULPHIDE.**—1s. to 1s. 2d. per lb.

### Pharmaceutical and Photographic Chemicals

The following changes are reported in the prices of pharmaceutical and photographic chemicals:—

**ACID, CITRIC.**—1s. 1d. per lb.

**ACID, TARTARIC.**—1s. 1½d. per lb.

**POTASS. BITARTRATE,** 99 100% (CREAM OF TARTAR).—105s. per lb.

### Coal Tar Products

**ACID, CARBOIC (CRYSTALS).**—5½d. to 6½d. per lb. Crude, 60s. 1s. 5½d. to 1s. 6½d. per gal. SCOTLAND: Sixties, 1s. 7d. to 1s. 8d.

**ACID, CRESYLIC.**—99/100, 1s. 7d. to 1s. 8d. per gal.; B.P., 2s. to 2s. 3d.; Refined, 1s. 10d. to 2s.; Pale, 98%, 1s. 7d. to 1s. 8d.; Dark, 1s. 4d. to 1s. 4½d. LONDON: 98/100%, 1s. 6d. Dark 95/97%, 1s. 4d. SCOTLAND: Pale 99 100%, 1s. 3½d. to 1s. 4½d.; 97 99%, 1s. 1½d. to 1s. 2½d.; dark 97/99%, 1s. 0½d. to 1s. 1½d.; high boiling acid, 2s. 6d. to 3s.

**BENZOL.**—At works crude 7d. to 7½d. per gal. Standard motor, 1s. 2d. to 1s. 3d.; 90%, 1s. 3d. to 1s. 4d. Pure, 1s. 6d. to 1s. 7d. LONDON: Motor, 1s. 5½d. SCOTLAND: Motor, 1s. 3½d. to 1s. 4½d.; 90%, 1s. 0½d. to 1s. 10½d.

**CREOSOTE.**—Standard for export, 4½d. to 5d. nett per gal. f.o.b. for Home, 3½d. d/d. LONDON: 3d. to 3½d. f.o.r. North: 4d. to 4½d. LONDON. MANCHESTER: 3½d. to 4½d. SCOTLAND: Specification oils, 3½d. to 4d.; washed oil, 4d. to 4½d.; light, 4d. to 4½d.; heavy, 4½d. to 5d.

**NAPHTHA.**—Solvent, 90/160, 1s. 3d. to 1s. 4d. per gal.; 95/160, 1s. 4d. to 1s. 6d.; 90/190, 11d. to 1s. 2d. LONDON: Solvent, 1s. 1½d.

to 1s. 2d.; heavy, 11d. to 1s. 0½d. f.o.r. SCOTLAND: 90/160, 1s. 3d. to 1s. 3½d.; 90/190, 1s. 1d. to 1s. 2d.

**NAPHTHALENE.**—Purified crystals, £9 10s. per ton in bags. LONDON: Fire lighter quality, £3 to £3 10s.; 74/76 quality, £4 to £4 10s.; 76/78 quality, £5 10s. to £6. SCOTLAND: 40s. to 50s.; whizzed, 65s. to 70s.

**PITCH.**—Medium Soft, £4 10s. to £4 15s. per ton in bulk at makers' works. LONDON: £4 2s. 6d. to £4 7s. 6d. f.o.b. East Coast port. MANCHESTER: £4 to £4 10s. f.o.b. SCOTLAND: Coal tar pitch, £4 to £4 5s. per ton; export, £3 15s. to £4; blast furnace, £3.

**PYRIDINE.**—90/140, 3s. 9d. per gal.; 90/160, 4s. to 4s. 6d.; 90/180, 2s. 6d. SCOTLAND: 90/160%, 4s. to 5s.; 90/220%, 3s. to 4s.

**REFINED COAL TAR.**—SCOTLAND: 5d. to 5½d. per gal.

**TOUOL.**—90%, 2s. 6d. per gal.; Pure, 2s. 9d.

**XVLOL.**—1s. 10d. per gal.; Pure, 2s. 1d.

### Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:—

**ACID, BENZOIC, B.P. (ex Toluol).**—1s. 0½d. per lb.

**ACID, GAMMA.**—Spot, 4s. per lb. 100% d/d buyer's works.

**ACID H.**—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.

**ACID, NEVILLE AND WINTHER.**—Spot, 3s. per lb. 100% d/d buyer's works.

**ACID, SULPHANILIC.**—Spot, 8½d. per lb. 100% d/d buyer's works.

**ANILINE OIL.**—Spot, 8d. per lb., drums extra, d/d buyer's works.

**ANILINE SALTS.**—Spot, 8d. per lb. d/d buyer's works, casks free.

**BENZALDEHYDE.**—Spot, 1s. 8d. per lb., packages extra, d/d buyer's works.

**BENZIDINE BASE.**—Spot, 2s. 5d. per lb. 100% d/d buyer's works.

**o-CRESOL 30/31° C.**—£2 6s. 5d. per cwt., in 1-ton lots.

**m-CRESOL 98/100%.**—2s. 9d. per lb., in ton lots.

**p-CRESOL.**—34.5° C.—1s. 9d. per lb., in ton lots.

**DICHLORANILINE.**—2s. 2d. per lb.

**DIMETHYLANILINE.**—Spot, 1s. 6d. per lb., packages extra, d/d buyer's works.

**DINITROBENZENE.**—8½d. per lb.

**DINITROTOLUENE.**—48/50° C., 8d. per lb.; 66/68° C., 8½d. per lb.

**DIPHENYLAMINE.**—Spot, 2s. per lb., d/d buyer's works.

**a-NAPHTHOL.**—Spot, 2s. 4d. per lb., d/d buyer's works.

**h-NAPHTHOL.**—Spot, £75 per ton in 1-ton lots, d/d buyer's works.

**a-NAPHTHYLAMINE.**—Spot, 11½d. per lb., d/d buyer's works.

**h-NAPHTHYLAMINE.**—Spot, 2s. 9d. per lb. d/d buyer's works.

**m-NITRANILINE.**—5s. 10d. per lb.

**m-NITRANILINE.**—Spot, 2s. 9d. per lb. d/d buyer's works.

**p-NITRANILINE.**—Spot, 1s. 8d. per lb. d/d buyer's works.

**NITROBENZENE.**—Spot, 6½d. per lb.; 5-cwt. lots, drums extra, d/d buyer's works.

**NITRONAPHTHALENE.**—8½d. per lb.

**SODIUM NAPHTHIONATE.**—Spot, 1s. 9d. per lb. 100% d/d buyer's works.

**o-TOLUIDINE.**—Spot, 9½d. per lb., drums extra, d/d buyer's works.

**p-TOLUIDINE.**—Spot, 1s. 9d. per lb., d/d buyer's works.

### Nitrogen Fertilisers

**SULPHATE OF AMMONIA.**—Export.—The demand has continued satisfactory and the market has remained steady at £5 5s. per ton f.o.b. U.K. port in single bags. Home.—Merchants report a continued heavy volume of home buying for immediate delivery. The price continues unchanged at £7 per ton delivered in 6-ton lots to consumers' nearest station.

**NITRATE OF SODA.**—Imported material is offered at £9 per ton delivered in 6-ton lots to consumers' nearest station. Large stocks are held in certain parts of the country, but no large movement has been reported. The price of British nitrate of soda remains at the same level as the Chilean product.

**NITRO-CHALK.**—Unchanged at £7 5s. per ton delivered in 6-ton lots to consumers' nearest station. A good demand is reported.

### Latest Oil Prices

LONDON, March 30.—LINSEED OIL was barely steady. Spot, ex mill, £15 10s.; April, £13 7s. 6d.; May-August, £14 10s.; September-December, £15 12s. 6d., naked. RAPE OIL was inactive. Crude, extracted, £30; technical refined, £32, naked, ex wharf. COTTON OIL was neglected. Egyptian crude, £21 10s.; refined common edible, £26; deodorised, £28, naked, ex mill. TURPENTINE was steadier. American, spot, 56s. 6d.; April also 56s. 6d. per cwt.

HULL.—LINSEED OIL.—Spot and March closed at £13 2s. 6d.; April at £13 10s.; May-August at £14 5s.; September-December at £15 5s. per ton. COTTON OIL.—Egyptian crude, spot, £21 10s.; edible, refined, spot, £24; technical, spot, £24; deodorised, £26 per ton, naked. GROUNDNUT OIL.—Crushed/extracted, spot, £34 10s.; deodorised, £38 10s. PALM KERNEL OIL.—Crude, f.m.q., spot, £23 per ton, naked. RAPE OIL.—Crushed/extracted, spot, £29; refined, £31 per ton. SOYA OIL.—Crushed/extracted, spot, £22; deodorised £25 10s. per ton. COD OIL.—Nominal. CASTOR OIL.—Pharmacy spot, 47s. 6d.; first, 42s. 6d.; second, 40s. 6d. per cwt. TURPENTINE.—American spot, 58s. 9d. per cwt.

\* Prices quoted by other manufacturers.

## Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

### Mortgages and Charges

[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an \*—followed by the date of the Summary, but such total may have been reduced.]

BATHITE, LTD., Bath, chemical manufacturers. (M., 2/4/32.) Registered March 10, two substituted securities for £750 owing on mortgage dated December 31, 1925, to Mrs. L. L. Mortimore, Woodbine West Street, Godmanchester, and others; charged on certain rent charges. \*£2,000. December 31, 1930.

ALLIANCE ARTIFICIAL SILK, LTD., Oulton Broad. (M., 2/4/32.) Registered March 16, £30,000 prior lien debenture and a charge collateral thereto, to J. Rout, Marlborough House, Ipswich Road, Norwich; general charge and charged on land and buildings at Oulton Broad. \*Nil. April 8, 1930.

EGYPTIAN OIL AND CAKE MILLS, LTD., London, E.C. (M., 2/4/32.) Registered March 16, agreement continuing credits on current account up to £E25,000 and £F25,000 allowed to company by Barclays Bank (Dominion, Colonial and Overseas) and Ottoman Bank respectively under mortgage registered November 4, 1931; charged on property in Alexandria, etc. \*£52,518. January 14, 1932.

### Company News

HADFIELDS, LTD.—The directors announce that they are unable to pay any dividend on the ordinary shares for the year 1931.

JOHN KNIGHT, LTD.—A final dividend of 20 per cent., making 30 per cent. for the year 1931, is recommended by the directors.

BURT, BOULTON AND HAYWOOD, LTD.—An interim dividend for the year ending June 30, 1932, of 4 per cent., less tax, on the ordinary shares is announced, payable on March 31.

THOS. FIRTH AND JOHN BROWN, LTD.—The directors announce that in view of the continued depression of the steel industry, they consider it inadvisable to pay any dividend on the preference shares.

ASSOCIATED DYERS AND CLEANERS, LTD.—A net profit of £36,320 is reported for the year 1931. The preference dividend is to be paid, as usual, on April 30, but the directors do not recommend any dividend on the ordinary shares. The amount carried forward is £32,510.

THARSIS SULPHUR AND COPPER CO., LTD.—After writing off £28,929 for depreciation, a net profit of £62,577 is shown for the year 1931, against £131,015 for the previous year. A dividend of 5 per cent., less tax, compared with 10 per cent. last year, is recommended, leaving £30,069 to go forward.

HADFIELDS, LTD.—In view of the necessity of conserving resources no dividend has been paid on the 4½ per cent. cumulative preference shares during 1931, and the directors now recommend that £25,996 standing to the credit of the profit and loss account be carried forward.

BRITISH OIL AND CAKE MILLS, LTD.—In their report for 1931 the directors state that the net profit was £666,162. The ordinary dividend is to be 10 per cent., against nothing last year and 3 per cent. in 1929. In addition, £100,000 is placed to a dividend reserve, leaving the carry-forward slightly higher at £28,333.

PINCHIN, JOHNSON AND CO., LTD.—A net profit of £272,018 is reported for the year 1931, which compares with £391,323 in the previous year. A final ordinary dividend of 7 1/6 per cent. is recommended, making a total of 17½ per cent. for the year, against 22½ per cent. in 1930. A substantial capital sterling profit has accrued in the case of foreign investments, and the directors propose to transfer a portion of this profit—namely, £50,000—as to £25,000 to a special reserve for contingencies, and £25,000 to the credit of the profit and loss account. A sum of £65,736 is carried forward.

BRITISH PORTLAND CEMENT MANUFACTURERS, LTD.—In their report for 1931 the directors state that the total revenue amounted to £738,147, and compared with £731,948 for the previous year. They recommend the payment of a final dividend of 10 per cent. on the ordinary shares, making 15 per cent. for the year, the same as in 1930. The sum of £250,000 has been placed to general depreciation reserve, and £5,000 to barge depreciation account, both as last year. In addition, £49,441 has been provided for the debenture stock sinking funds. The annual meeting will be held at Portland House, London, on March 31, at 12 noon.

CANADIAN CELANESE, LTD.—The net profit from operations for 1931 was \$1,260,449, as compared with \$1,254,530 for the previous year. After making provision for income-tax, depreciation and other deductions, and deducting \$77,612 to re-establish the reserve for contingencies to \$100,000, there was carried to surplus account \$805,165, against \$811,512 last year. A special reserve of \$150,000 has been appropriated from surplus for market depreciation of investment securities held, or to be used for other purposes. The total surplus at the end of the year was \$1,730,478, as compared with \$1,713,478 at the end of 1930. The 7 per cent. cumulative Participating Preferred shares received their full dividend, whereas, in 1930, only 3½ per cent. was paid.

### New Chemical Trade Marks

These lists are specially compiled for us from official sources by Gee and Co., Patent and Trade Mark Agents, Staple House, 51 and 52 Chancery Lane, London, W.C.2, from whom further information may be obtained, and to whom we have arranged to refer any inquiries relating to Patents, Trade Marks and Designs.

Opposition to the Registration of the following Trade Mark can be lodged up to April 16, 1932.

#### COFFEMINAL

529,388. Class 3.—Chemical substances prepared for use in medicine and pharmacy. Bayer Products, Ltd., 31 to 34 Basinghall Street, London, E.C.2; merchants and manufacturers. February 13, 1932.

#### ERINOL

528,380. Class 1.—Synthetic resin intermediates, being chemical substances for use in manufactures. Erinoid, Ltd., 58 Coleman Street, London, E.C.2; manufacturers. January 6, 1932.

#### HOWARDS'

Advertised before acceptance, the Applicants alleging distinctiveness.

523,046. Class 3.—Chemical substances prepared for use in medicine and pharmacy. Howards and Sons, Ltd., Uphall Works, Uphall Road, Ilford, Essex; chemical manufacturers. May 26, 1931.

#### SHIRLAN

529,320. Class 2.—Chemical substances used for agricultural, horticultural, veterinary, and sanitary purposes. British Dyestuffs Corporation, Ltd., Hexagon House, Blackley, Manchester; manufacturers. February 11, 1932.

### Chemical Trade Inquiries

These inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country) except where otherwise stated.

CANADA.—H.M. Senior Trade Commissioner in Canada reports that a firm in Quebec desires to receive quotations from United Kingdom manufacturers of disinfectants and liquid toilet soaps. (Ref. No. B.X.1439.)

DANZIG.—An agent at Danzig desires to obtain representation of a United Kingdom firm importing soya beans and copra. (Ref. No. 589.)

GERMANY.—A firm established at Cologne wishes to obtain the representation of United Kingdom manufacturers of pharmaceutical goods and medical preparations. (Ref. No. 590.)

SOUTH AFRICA AND SOUTHERN RHODESIA.—A London agent with local representatives covering the whole of South Africa and Southern Rhodesia desires to secure the representation of United Kingdom manufacturers of light and heavy chemicals, bottles, etc. (Ref. No. 582.)

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